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An Introduction to Financial Markets and Institutions

Second Edition

Maureen Burton • Reynold Nesiba • Bruce Brown

An Introduction to Financial Markets and Institutions

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Maureen Burton • Reynold Nesiba • Bruce Brown

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With much love to my grandchildren, Luke and Lucy Paddock, Madison Zehntner, and any grandchildren still to come!

—Maureen Burton

To Nina, Byron, and Yuka—a lot to be thankful for.

—Bruce Brown

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Preface

INTRODUCTION TO THE TEXT

In late 2009, the economy continues to be embroiled in a financial crisis that is unprecedented since the Great Depression. What started in the housing market spread throughout the entire financial system and wreaked havoc in the broader economy. The stock market experienced the deepest bear market since the Great Depression, even surpassing the bursting of the stock market bubble in the early 2000s. The unemployment rate hit a 25-year high. As a result, rapid and revolutionary changes are occurring within financial markets and institutions and will continue to occur for some time.

Even before the current crisis, financial markets and institutions had been undergoing significant changes. Changes in information and computer technologies fostered the growth of new financial instruments and products. Many of the new products were thought to be creative ways to manage risk in a globalized environment. Technological changes also allowed for the unbundling of risks among financial market participants. Increased competition and globalization spurred on the changes. Regulations put in place during the Great Depression were removed. Financial institutions entered nontraditional venues. Laws forbidding the mergers of banks, securities firms and insurance companies were overturned. Mega-mergers occurred that changed the scope, size, and activities of financial institutions and created mega-firms that were "too big to fail."

Many of these changes have contributed to or facilitated the current crisis that financial markets are caught in. Managers of financial institutions must now make decisions in a new environment where caution can no longer be thrown to the wind. In 2010, financial market participants, policy makers, and regulators face new challenges as they continue to adapt to the changing environment in order to help the financial system and the economy recover. No doubt the regulatory structure of the financial system will see a total overhaul as a result.

Given the economic climate, the motivation in developing this text is threefold.

- First, to give students an understanding of how financial markets and institutions work and their role in the broader economy.
- Second, to capture the recent changes in financial markets and institutions, some of which have contributed to the ongoing financial crisis, and some of which result from the crisis.
- Third, and most importantly, to present an analytical framework that enables students to understand and anticipate changes in financial markets and institutions as the financial system continues to evolve.

INTENDED AUDIENCE

The text is intended for an introductory undergraduate course in financial markets and institutions taught in either a finance or an economics department. It may also be suitable for use in a financial markets and institutions course in an MBA Program.

CONTENTS OF THE TEXT

An Introduction to Financial Markets and Institutions, *Second Edition* covers the traditional material found in a financial markets and institutions text and incorporates many of the recent changes and controversies within the financial services industry.

In addition, there are several unique features in this edition:

With regard to the ongoing financial crisis, we cover the origins and causes of the crisis including the development of subprime and Alt-A mortgages, the erosion of lending standards, the securitization of mortgages, and the development of credit derivatives. We look at financial bubbles and how they affect markets and lead to financial crises. We focus on what policy makers have done to mitigate the crisis. We have expanded our coverage of financial instability including Hyman Minsky's long-term theory of financial instability. With regard to specific actions taken as a result of the crisis, we have in-depth coverage of the following topics:

- In Chapter 17 on regulation, we cover the **Emergency Economic Stabilization Act** of September 2008. We look at not only the uses of the first half of the bailout funds with regard to injecting capital into the largest financial institutions but also the plan on how to use the second half of the funds. We look at the Treasury's proposal to overhaul the regulatory system.
- In Chapter 14 on the mortgage market, we look at the **Mortgage Bailout Plan** that is part of the **Financial Stability Plan.**
- In Chapter 21 on financial instability, we cover the **American Recovery and Reinvestment Act of 2009**—the $787 billion fiscal stimulus package that includes both increases in government spending and tax cuts and is designed to mitigate the economic downturn of 2009.
- In Chapter 10 on monetary policy, we look at the new special lending facilities created by the Fed in response to the crisis. We explore in detail the Fed's new tool kit and how the new lending has caused a doubling of the Fed's assets. We believe that this is something totally under the radar screen for many Americans.

ORGANIZATION OF THE TEXT

An Introduction to Financial Markets and Institutions, *Second Edition* is organized in seven parts:

Part One consists of a four-chapter introduction. The student is introduced to the economy, money and credit, financial markets and products, and financial intermediaries.

Part Two consists of four chapters on financial prices, including interest rate determination, the term structure of interest rates, the efficient market hypothesis, and exchange rate determination. An alternative model of equilibrium based on the flow of funds among sectors and market efficiency is also presented.

Part Three consists of two chapters on the Fed and monetary policy.

Part Four consists of four chapters on financial markets including the money market, the corporate and government bond markets, the stock market, and the mortgage market.

Part Five has six chapters on financial institutions including commercial banking, savings associations and credit unions, regulation, insurance companies, pensions plans, securities firms, mutual funds, and financial conglomerates.

Part Six has four chapters on managing financial risk that look at financial instability including Hyman Minsky's financial instability hypothesis, risk assessment and management, forward futures, options and asset-backed securities, and interest rate and currency swaps.

Part Seven has two chapters on the international financial system and monetary policy in an increasingly globalized environment.

An Introduction to Financial Markets and Institutions, Second Edition is designed to be flexible. After completing Part One, the instructor can emphasize the relevant parts of the text depending on the focus of the class. In parts that are not being emphasized, chapters may be skipped.

PEDAGOGICAL FEATURES OF THE TEXT

In addition to presenting the material in a clear and concise manner, we have incorporated the following pedagogical tools to enhance the student's understanding.

- **Learning objectives** at the beginning of each chapter tell the student where the chapter is heading and what questions will be answered by studying the chapter.
- **Recap** sections are dispersed throughout each chapter to summarize analytical material the student should know before moving forward, and also to check that the student has mastered the preceding material.
- Highlighted features include:
  - **A Closer Look** feature that delves more deeply into the topic being discussed and provides enhancement material.
  - **Looking Out** boxes that add relevant international material that show the interrelationships of global financial systems.
  - **Looking Back** features that provide historical background of the foundations of current economic circumstances.
  - **Looking Forward** boxes that make projections about possible future situations within the arena of the financial system and economies.
  - **Cracking the Code** feature that shows students how to interpret the financial pages of daily newspapers, including stock, bond, Treasury bill, mutual fund, foreign exchange quotes, and futures and options prices.
  - **Key Terms** are bold-faced in the text where they are first defined, listed at the end of each chapter, and also appear in the margins with definitions.
  - **Summary of Major Points** that are chapter summaries intended to reinforce the chapter content and to aid in study for exams and quizzes, as well as to provide another check for students to make sure they have not missed an important concept of the chapter.
- End-of-Chapter materials include:
  - **Review Questions** and **Analytical Questions** that appear at the end of each chapter. Questions marked with a check can be answered with a short answer or a single number. Instructors may choose to use these objective questions for homework in larger sections.
  - Annotated **Suggested Readings** that direct the student to related material and include relevant information available on the Internet.

SUPPLEMENTS TO THE TEXT

An Introduction to Financial Markets and Institutions, Second Edition offers a comprehensive and well-crafted supplemental package for the instructor.

- The test bank was carefully prepared by the authors and questions have been thoroughly tested on students.

- Microsoft PowerPoint slides have also been prepared by the authors and can be used to enhance lectures. The slides contain all of the exhibits in the text and additional lecture slides that follow the material covered in the text.

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PART 1

Introduction

1 Introduction and Overview

2 Money: A Unique Financial Instrument

3 Financial Markets, Instruments, and Market Makers

4 Financial Intermediaries and Risk

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CHAPTER ONE

1

Introduction and Overview

Learning Objectives

After reading this chapter, you should know:

The subject matter of economics and finance

The general role of the financial system in a modern economy

The major functions of financial markets and financial intermediaries

What saving is and its uses

How the financial system channels funds from lenders to borrowers

The role of the Federal Reserve and its regulatory and monetary policy responsibilities

WHAT THIS BOOK IS ABOUT

Why do investors have so many different ways to invest funds? Should a firm that wants to finance new investment spending issue stocks or bonds? Why have financial institutions and financial regulations changed so dramatically in the last 25 years? How has the mortgage market evolved in recent years? Why does the international value of the dollar fluctuate so much and how does that affect exports, imports, and flows of funds among countries? What is meant by the *globalization* of finance? How have technological changes affected financial markets? What are the complex financial instruments known as *derivatives?* Why have there been so many mergers between financial institutions? Why do banks and other financial institutions pay so much attention to what the Federal Reserve is doing? What are the causes of the severe economic downturn in 2008 and 2009 that started in financial markets and institutions and spread to the broader economy? What can policy makers do to mitigate this crisis and how will that affect the structure and regulation of financial markets and institutions?

We could go on, but you get the idea. This list of questions represents only a sample of the issues that motivate the discussions found throughout the text. As the questions indicate, these matters affect many aspects of our lives every day.

This chapter begins your study of financial markets, institutions, and instruments in a global economy. It introduces the subject matter and provides an overview of the key concepts and relationships that are vital to understanding the system. Most of the details are ignored, and most terms are not rigorously defined and examined; this is the introduction! However, don't underestimate the importance of a good beginning.

ECONOMIC AND FINANCIAL ANALYSIS OF AN EVER-CHANGING SYSTEM

Economics
The study of how society decides what gets produced and how, and who gets what.

Economics is the study of how a society decides what gets produced, how it gets produced, and who gets what. More specifically, given unlimited wants on the part of society, economics is concerned with the following processes:

1. How scarce resources (land, labor, capital, and natural resources) are allocated in the production process among competing uses.[1]
2. How income generated in the production and sale of goods and services is distributed among members of society.
3. How people allocate their income through spending, saving, borrowing, and lending decisions.

Microeconomics
The branch of economics that studies the behavior of individual decision-making units such as households and business firms.

Macroeconomics
The branch of economics that studies the aggregate, or total, behavior of all households and firms.

For convenience, economics is traditionally divided into the study of the causes and consequences of individual decision-making units such as households and business firms in a particular market, and the study of the causes and the effects resulting from the sum of decisions made by all firms or households in many markets. The former type of analysis is called **microeconomics;** the latter, more aggregative, type is called **macroeconomics.**

Finance
The study of how the financial system coordinates and channels the flow of funds from lenders to borrowers—and vice versa—and how new funds are created by financial intermediaries during the borrowing process.

Finance is the study of the financial or monetary aspects of production, spending, borrowing, and lending decisions. Finance deals with the raising and using of money by individuals, firms, governments, and foreign investors. We are familiar with our decisions to spend, borrow, lend, or save. Our everyday language includes such terms as *interest rates*, *checking accounts*, *debit cards*, *banks*, and *credit cards*. Finance in this context deals with how individuals manage money.

At a macro level, finance is concerned with how the financial system coordinates and channels the flow of funds from lenders to borrowers and vice versa, and how new funds may be created during the borrowing process. The channeling and coordination

process and its effects on the cost and availability of funds link developments in the financial system to developments in the rest of the economy. This aspect of financial analysis is emphasized in this text.

As you will soon learn, the production and sale of goods and services within the economic system are intimately related to the deposits, stocks and bonds, and other financial instruments that are bought and sold in the financial system. Thus, what happens on Wall Street can have a profound effect on what happens on Main Street and vice versa.

Because the financial system is vital to a healthy economy, the government regulates and supervises its operation. Such regulatory policy is aimed at promoting an efficient financial system. By establishing and enforcing operating regulations for financial markets and institutions, regulators seek to promote competition and efficiency while preserving the safety and soundness of the system.

Complicating our analysis of the interaction between the financial system and the economy is the fact that the financial system is not stagnant. It continually evolves and changes, sometimes at a faster pace than at other times. For various reasons (discussed in later chapters), the past several decades have seen rapid change, including the ongoing globalization of financial markets. The system is different than it was 20 years ago, and it will be different 20 years from now. The major forces behind these changes are changes in government regulations, advances in computer technologies, and innovations in the ways people spend, save, and borrow funds.

In recent decades, firms and individuals have developed new ways to raise and use money. Today, many manifestations of these financial innovations are all around us. For example, 24-hour automated teller machines (ATMs) are common, debit cards and credit cards are widely accepted at grocery stores, gas stations, and department stores, and home equity lines of credit allow home owners to borrow against the equity in their homes by writing checks as the need arises. Investors have an increasing array of mutual funds and other domestic and global financial instruments to choose from. Stocks and bonds can be purchased over the Internet at a fraction of the brokerage fees charged by full-service brokerage firms. None of these innovations were widely available in the mid-1980s.

New ways for financial and nonfinancial firms to manage risks also have been developed. Banks have merged with brokerage firms, insurance companies, and other firms that offer a whole host of financial and nonfinancial services. All this merger activity in the financial services industry has created new types of financial institutions that transcend national borders. Although still in an early stage in the United States, the use of smart cards and stored-value cards (as well as other ways to make electronic payments) is expected to explode in the very near future. These developments, most of which have been made possible because of changes in technology, have had or will have an impact on spending, saving, borrowing, and lending decisions. Not surprisingly, then, we shall closely examine the causes and consequences of these changes in the financial system.

Because of these financial innovations and other factors, U.S. Congress and the regulatory authorities such as the Federal Reserve have had to reconsider the costs and benefits associated with certain regulations. From the early 1970s until the late 1980s, regulatory changes were mostly in the direction of **deregulation,** which is the removing or phasing out of some existing regulations. Some regulations were eliminated because it was felt that they had become increasingly ineffective as firms and households found ways to get around them. Other regulations were removed because they were believed to inhibit competition and weaken rather than strengthen the financial system. During the late 1980s and early 1990s, however, crises in various financial markets, sometimes requiring taxpayer bailouts, led to attempts at *re-regulation.* By the mid-1990s, the recovery of the financial services industry and a booming economy led to the passage of major legislation that removed regulations forbidding interstate branching by banks. This, coupled

Deregulation
The removing or phasing out of existing regulations.

with continuing advances in computer technologies, fostered dramatic changes in the financial system. In the early 2000s, major legislation took effect that further deregulated the activities of firms in the financial services industry. The new legislation allowed banking, investment, and insurance services to be offered by one giant financial supermarket that made possible one-stop shopping for all their customers' financial services needs. As the financial system continues to evolve, we can expect that new and different ways of regulating will be introduced, analyzed, and tested, including the growth of international standards for financial institutions that participate in the global financial system. In 2008, the economy was experiencing an unparalleled banking crisis that some analysts thought was partially caused by the earlier deregulation. This crisis will undoubtedly hasten the passage of new legislation to regulate the financial system. Nevertheless, the goals of ensuring the safety and soundness of the financial system while fostering efficiency and competition will remain the same.

FINANCE IN OUR DAILY LIVES

Money
Something acceptable and generally used as payment for goods and services.

An individual's financial objective is to make payments when due and to manage funds efficiently until they are needed. To make payments we need **money**—that is, something that is acceptable in payment, whether it's for a cup of coffee or rent on a beach house.[2] While reading this book, keep in mind that only money can generally be used for payments.

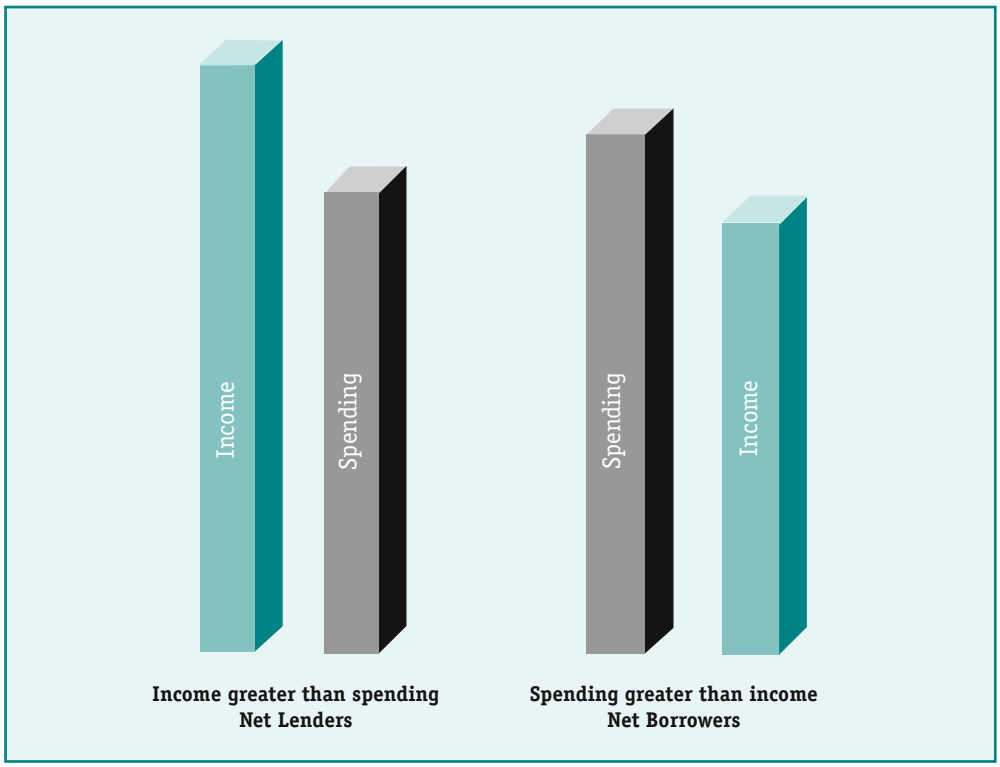
Saving
Income not spent on consumption.

In our daily lives, we receive income periodically (weekly, monthly, etc.), but our expenditures are more or less continuous, depending on our lifestyles. Given this lack of synchronization between the receipt of income and expenditures, we need to manage our money over, say, a month so that funds will be available when we make purchases of goods and services—called *consumption spending*. Income that is not spent on consumption is called **saving.** Part of household saving may be spent directly on investment goods, such as new houses.[3] With the remainder of saving, individuals will acquire financial assets, which also have to be managed.

How might the funds not used for consumption or investment in new houses be managed? We could take currency (paper money), put it in an empty coffee can, and bury it in the backyard. We also could put the funds into a savings or money market account to earn interest. Other alternatives include buying corporate bonds, shares of common stock, Treasury bills, or other financial assets. The choices we make depend on how we wish to balance the key financial characteristics of concern to savers: the expected return (gain) and the risk of loss associated with acquiring and holding a particular asset. Some assets, such as Treasury bills, are relatively riskless; if you own such bills, you can be pretty sure the government will pay the interest and principal you are due. Other assets, such as bonds issued by new corporations not yet earning significant profits, may offer a much higher return, but they also carry the risk that the firm may fail and declare bankruptcy, meaning you will get nothing! Moreover, if an unexpected need arises and you need to get back the funds you originally loaned, you want your funds to be invested in liquid assets that can be converted quickly to cash without substantial loss. Balancing such considerations is the essence of managing a portfolio—a collection of financial assets—be it by an individual or by a financial institution.

What has just been described should be familiar, but to facilitate clarity and effective communication, the terminology employed in this text must be distinguished from colloquial use. *Income* is the flow of revenue (receipts) we receive over time for our services. With this income, we can buy and consume goods. If we have funds left over after consumption, we are saving, and we have to decide how to allocate those funds among the various types of financial assets available or invest them in real assets such as new houses. If, however, we spend more than we earn, we have a deficit and have to decide

1-1
Net Lenders and Net Borrowers



how to finance it. When we spend less on consumption and investment goods than our current income, we are **net lenders.** If the opposite is true, we are **net borrowers.** Exhibit 1-1 portrays net lenders and net borrowers.

Net Lenders
Spending units such as households and firms whose income exceeds their spending.

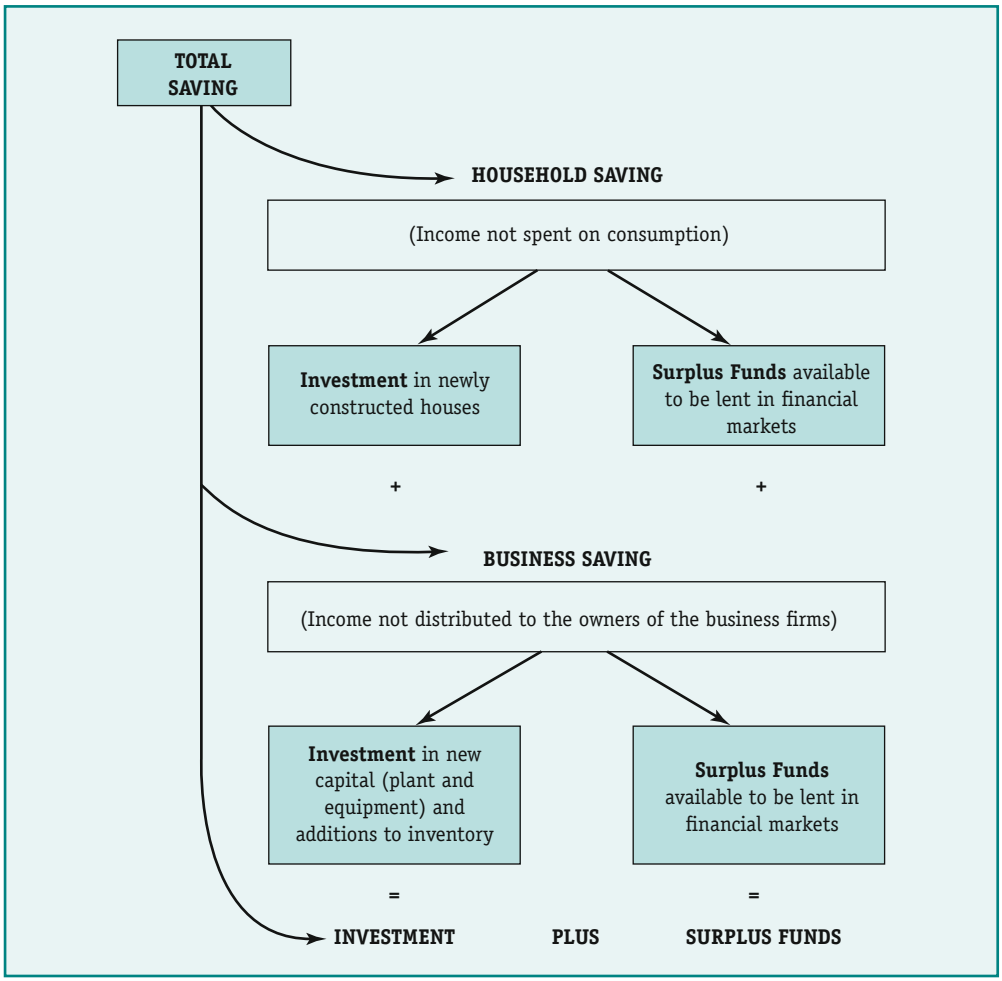
Net Borrowers
Spending units such as households and firms whose spending exceeds their income.

So far we have restricted our analysis to individuals and households, but business firms may also spend more or less than their income. Business firms do not spend on consumption, so all business income is saving except income distributed as dividends to the owners of the firms. With their saving, business firms make investment expenditures in capital and inventories or acquire financial assets. A firm's investment expenditures often exceed its available funds.[4] In this case, the firm incurs financial liabilities by issuing financial claims against itself. Note that every financial instrument is an asset to the owner (buyer) of the instrument and a liability to the issuer (seller). Exhibit 1-2 shows the uses of saving for households and business firms.

The fact that some people or business firms are in deficit positions while others are in surplus positions creates an opportunity or a need for a way to match them up. The financial system links up these net lenders and net borrowers. The government and foreign sectors may also spend more or less than their current available funds and hence be net borrowers or net lenders.

Recap

Economics studies how scarce resources are allocated among conflicting wants. Finance studies how the financial system coordinates and channels the flows of funds from net lenders to net borrowers. Net lenders spend less than their current income. Net borrowers spend more than their current income. Household saving may be used for investment in new housing or to acquire financial assets. Business saving may be used for investment in capital and inventories or to acquire financial assets. Financial instruments are financial assets to the holder of the instrument and financial liabilities to the issuer.



Financial Markets
Markets in which spending units trade financial claims.

Direct Finance
When net lenders lend their funds directly to net borrowers.

Financial Institutions
Firms that provide financial services to net lenders and net borrowers; the most important financial institutions are financial intermediaries.

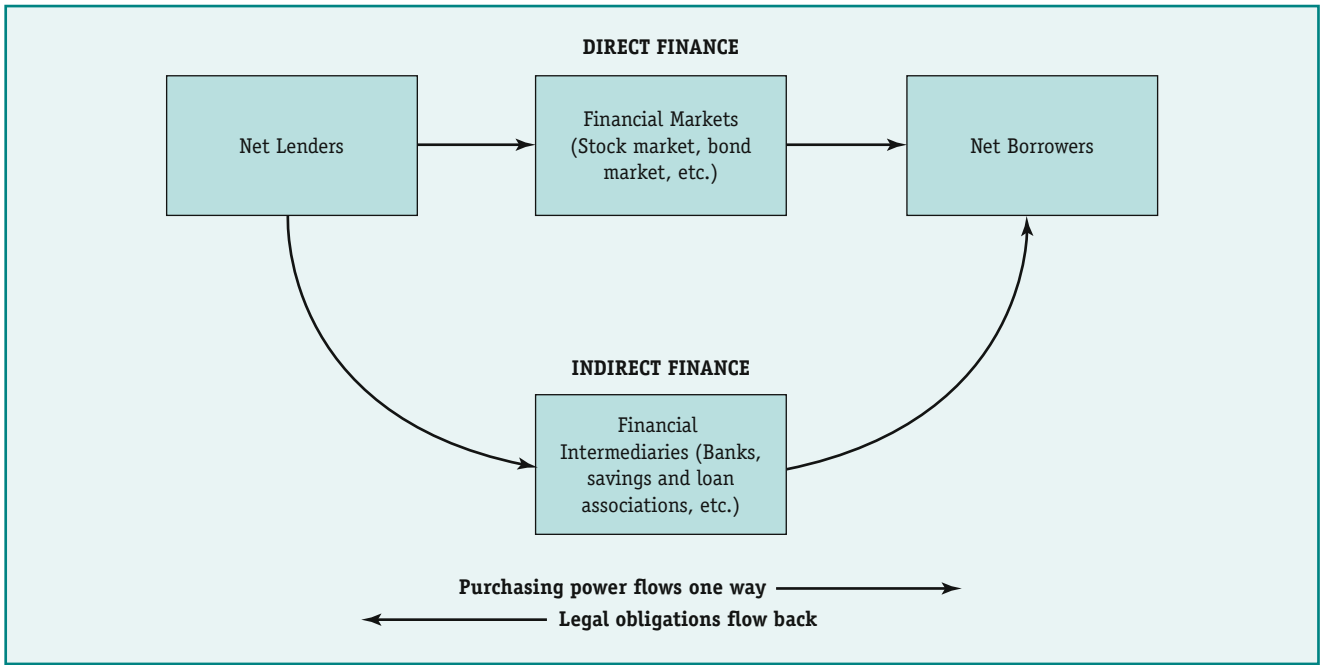
Financial Intermediaries
Financial institutions that borrow from net lenders for the purpose of lending to net borrowers.

Indirect Finance
When net borrowers borrow from financial intermediaries that have acquired the funds to lend from net lenders.

INTRODUCING THE FINANCIAL SYSTEM

A well-organized, efficient, smoothly functioning financial system is an important component of a modern, highly specialized economy. The financial system provides a mechanism whereby a firm or household that is a net lender may conveniently make funds available to net borrowers who intend to spend more than their current income. The key word here is *conveniently.*

The financial system is composed of financial markets and financial institutions. Net lenders can lend their funds directly to net borrowers in **financial markets.** An example is the market for corporate bonds. General Motors can sell bonds to finance, say, the construction of a new plant in Mexico, and Emma from Kansas can purchase some of the bonds with the income she does not spend on goods and services. This is called **direct finance.** Purchasing stocks is another example of direct finance. **Financial institutions** are firms that provide financial services to net lenders and net borrowers. The most important financial institutions are **financial intermediaries**—various institutions such as banks, savings and loan associations, and credit unions—that serve as go-betweens to link up net lenders and net borrowers. Here the linkage between saver and borrower is indirect. For example, a household might deposit some surplus funds in a savings account at a bank, and the bank, in turn, might make a loan to a borrower. This is called **indirect finance.** Even though the ultimate lender is the spending unit



with surplus funds, the borrower owes repayment of the loan to the financial intermediary, and the financial intermediary owes repayment of the deposit to the lender. Other financial institutions that are not financial intermediaries merely link up (for a fee) the net lenders to purchase the stocks or bonds issued by net borrowers.

Exhibit 1-3 pulls together the discussion on this point. Net lenders can lend funds either directly in the financial markets or indirectly through financial intermediaries. If they lend funds in the financial markets, they acquire direct, or primary, financial claims against the income of the borrower. Net borrowers borrow funds by issuing these **financial claims** in the market. To the holder/purchaser, the claims are assets owned; but to the issuer, the claims are liabilities owed. For example, the General Motors bonds mentioned previously are assets to Emma and liabilities to General Motors.

Financial Claims
Claims issued by net borrowers in order to borrow funds from net lenders who purchase the claims; assets to the purchaser, liabilities to the issuer.

If net lenders lend funds through financial intermediaries, they acquire indirect, or secondary, financial claims on those intermediaries, which, in turn, acquire direct claims on net borrowers. Putting funds into a savings account is a classic example of acquiring a secondary claim on a financial institution. The institution will, in turn, make loans directly to a net borrower. Through lending activities, some financial intermediaries may also create new funds (money), which meet the needs of a growing economy. In either case, whether funds flow directly from net lenders or indirectly from intermediaries, credit is extended.

MORE ON FINANCIAL INTERMEDIARIES

One might ask, "Why do we need financial intermediaries? Why don't savers lend directly to borrowers?" To answer this, let us begin with the initial choices and decisions that we would face as a household. If we are working, we have a steady flow of income. If we spend only part of our income on consumption and investment goods, then we have a surplus and

have funds available to lend in financial markets. If we spend more than our income, then we have a deficit and must borrow. Because deciding what to do with a surplus is more pleasant than worrying about how to finance a deficit, let us assume that we spend only part of our income on consumption and investment. Now what should we do with our surplus?

A net lender basically has two decisions to make. The first choice is between holding the surplus in the form of cash (paper currency and coin) or lending it out.[5] Because cash does not earn interest, we would probably decide to lend out at least a portion of our surplus funds to earn some interest income. This leads us to the second decision the surplus household must make: How and where is the surplus to be loaned? We could go directly to the financial markets and purchase a new bond being issued by a corporation. Presumably, we would not pick a bond at random. For example, we might look for a bond issued by a reputable, creditworthy borrower who will be likely to pay the promised interest on schedule and to repay the principal (the original amount of the loan) when the bond matures in, say, 10 years. In short, we would appraise the risk or probability of **default,** which is the failure of the borrower to pay interest, repay principal, or both.

Default
When a borrower fails to repay a financial claim.

To minimize the risk of our surplus being wiped out by the default of a single borrower, we might want to spread our risks out and diversify. We can accomplish this by spreading our surplus over a number of net borrowers.[6] In nontechnical terms, we would avoid putting all our eggs into one basket. Note that most net lenders are not experts in appraising and diversifying risk and would have to hire a broker for advice about the primary claims issued by net borrowers.

All of this would take time and effort. As a result, many net lenders prefer to rely on the expertise of others, such as financial intermediaries. Financial intermediaries acquire the funds of net lenders by offering claims on themselves. Thus, the net lender has actually made a loan to the financial intermediary and therefore has a financial claim on the intermediary in the amount of the surplus funds. To determine its profit, the financial intermediary subtracts what it pays to net lenders for the use of the funds from what it earns on the loans and other investments it makes with those funds.

Financial intermediaries pool the funds they acquire from many individual net lenders and use the funds to make loans to businesses and households, purchase bonds, and so forth. The intermediaries are actually lending out the surpluses they accept from individual net lenders while also appraising and diversifying the risk associated with lending directly to net borrowers. Because the intermediaries specialize in this kind of work, it is reasonable to presume that they know what they are doing and, on average, do a better job than individual net lenders could do. Financial intermediaries minimize the costs—called **transactions costs**—associated with borrowing and lending.

Transactions Costs
The costs associated with borrowing and lending or making other exchanges.

Another reason that net lenders often entrust their funds to financial intermediaries is that the secondary (indirect) claims offered by intermediaries are often more attractive to many lenders than primary (direct) claims available in financial markets. In many cases, for example, the secondary claims of intermediaries are insured by an agency of the federal government such as the FDIC.[7] Therefore, the risk of default associated with holding a secondary claim is often less than with a primary claim.

In addition, secondary claims are attractive because they are often more liquid than primary claims. **Liquidity** refers to the ease of exchanging a financial claim for cash without loss of value. Different types of claims possess varying degrees of liquidity. A claim that is easily exchanged for cash, such as a savings deposit, is highly liquid; exchanging a less-liquid claim involves more significant time, cost, and/or inconvenience. A rare oil painting is an example of a less-liquid asset.

Liquidity
The ease with which a financial claim can be converted to cash without loss of value.

Suppose you loaned funds directly to a small, obscure corporation, and the loan's term of maturity (the time from when you gave the firm the funds until it must pay back the principal) was two years. You have a financial claim in the form of a loan contract,

and the corporation has your surplus funds. What would happen if after one year you suddenly wanted the funds back for some emergency expenditure? You might ask the corporation to pay you back at once, before the due date of the loan. If this option is closed because the corporation is unwilling or unable to pay off the loan immediately, you might try to sell the claim on the borrower to someone else who is willing to hold it until maturity. Although there are organized markets for the buying and selling of certain types of existing financial claims, such markets do not exist for all types of claims. The hassle associated with unloading the loan contract in a time of crisis is obvious. To avoid such inconvenience, many net lenders prefer to hold claims on financial intermediaries and let the "experts" worry about any problems.

DEPOSITORY INSTITUTIONS AND OTHER TYPES OF INTERMEDIARIES

Depository Institutions
Financial intermediaries that issue checkable deposits.

The most familiar type and the largest group of financial intermediaries are **depository institutions** consisting of commercial banks, savings and loan associations, credit unions, and mutual savings banks. Not surprisingly, their principal source of funds comes from the deposits of individuals, business firms, and governments, both domestic and foreign. Depository institutions are particularly popular with net lenders because the secondary claims purchased by net lenders from them—that is, the deposits—are often insured and therefore relatively safe.

Checkable Deposits
Deposits that are subject to withdrawal by writing a check.

Checkable deposits, which as the name implies are subject to withdrawal by writing a check, are now offered by all depository institutions. Such deposits are money per se because they can be used in their present form as a means of payment. Other claims on depository institutions, such as savings deposits, are also quite liquid.

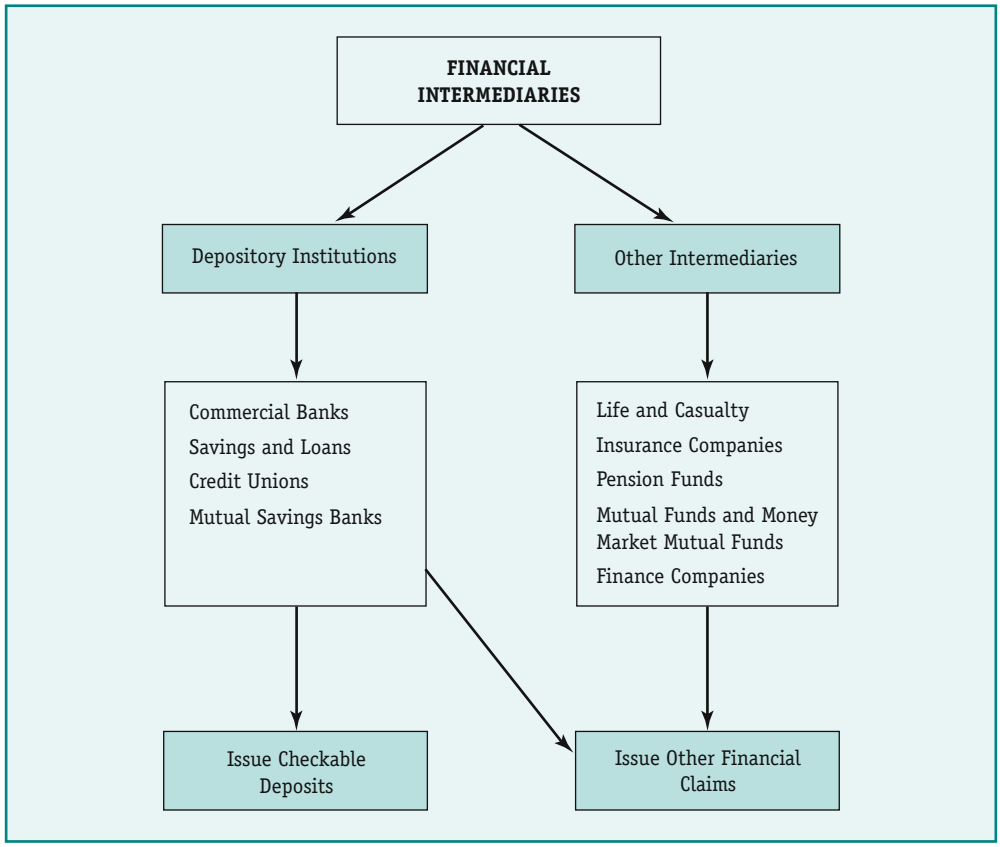
Other types of intermediaries offer specialized secondary claims. For example, insurance companies offer financial protection against early death (life companies) or property losses (casualty companies), while pension plans provide financial resources for retirement. All of these specialized intermediaries collect savings in the form of premium payments or contributions from plan participants. Each intermediary then uses the funds to purchase a variety of primary claims from net borrowers. Investment-type intermediaries (such as mutual funds and money market funds) pool the surplus funds of many small savers and invest them in financial markets, thereby offering the small savers greater opportunities to diversify than they would otherwise realize. Exhibit 1-4 highlights the various types of intermediaries.

Although our analysis covers intermediation in general, we pay particular attention to the role of depository institutions for several reasons. For one thing, depository institutions are by far the largest type of intermediary. They also are a central part of the process that determines the nation's money supply. Because one of our main objectives is to understand the nature and role of money in our economy, we will focus on the behavior of depository institutions and the process of intermediation in which they engage. By examining how money is provided, what it costs to obtain money when we need it, and what we can earn when we have enough of it to lend out, we will learn much about how money and the financial system affect our economy.

Recap

When net lenders lend directly to net borrowers, direct finance occurs. When net lenders put their funds in financial intermediaries, which then lend to net borrowers, indirect finance occurs. Financial intermediaries acquire the funds of net lenders by issuing claims on themselves. They use the funds to purchase the financial claims of net borrowers. The most important financial intermediaries are depository institutions that issue checkable deposits. Other financial intermediaries include life and casualty insurance companies, pension funds, mutual funds, money market mutual funds, and finance companies.

1-4
Types of Financial Intermediaries



THE FEDERAL RESERVE SYSTEM

Federal Reserve (The Fed)
The central bank of the United States that regulates the banking system and determines monetary policy.

The **Federal Reserve** (often referred to as "the Fed") greatly influences the way in which depository institutions serve as intermediaries and affect the money supply. Other financial markets and institutions are also greatly affected by the Federal Reserve. The Federal Reserve is a quasi-independent government agency that serves as our nation's central bank. Its influence begins with depository institutions and their role in the money supply process and spreads to other intermediaries and financial markets in general.

The Fed has a profound influence on the behavior of banks through 1) its regulatory policy and 2) its ability to affect interest rates and the total volume of funds available for borrowing and lending. In the past decade, depository institutions experienced a declining share of the funds available for borrowing and lending, while other financial and nonfinancial institutions have received an increasing share.[8] In addition, international financial flows (borrowing and lending that transcends national borders) have increased greatly. Because the Fed has more influence on domestic commercial banks and other depository institutions than on other financial institutions, there is concern that the Fed's ability to influence the economy through traditional avenues has actually declined. Nevertheless, the Fed continues to maintain a leading role in determining the overall health of the U.S. economy.

The Fed's influence on banks spreads through a number of channels to other financial intermediaries and to the transfer of funds from net lenders to net borrowers. By affecting interest rates and the volume of funds transferred from lenders to borrowers, the Fed can influence the aggregate, or total, demand for goods and services in the economy,

and thus influences the robustness of the economy as a whole. This relationship is shown in Exhibit 1-5. The middle of this figure—the financial system and economic behavior of spending units—represents the essential anatomy or structure of the economy. The task before us is to learn how each part of the economy operates and how the collective activity of the parts is affected by the Fed's **monetary policy**—the Fed's efforts to promote the overall health and stability of the economy.

Monetary Policy
The Fed's efforts to promote the overall health and stability of the economy.

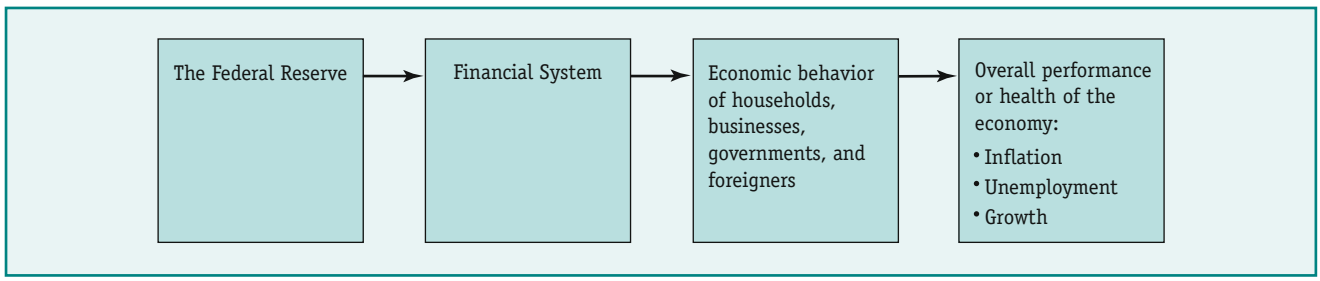
In terms of Exhibit 1-3, the Fed monitors the performance of the financial system and the economy with an eye toward augmenting or reducing the supply of funds flowing from lenders through financial markets and financial intermediaries to borrowers. Any action the Fed undertakes sets off a chain of reactions as depicted in Exhibit 1-5.

As we begin to think about the Fed's conduct of monetary policy and its effects on the economy, an analogy might be helpful. Think of the U.S. economy as a human patient. Just as a human body is made of many parts (arms, legs, torso), the U.S. economy is composed of many sectors (household, business, government, and foreign). Money and the acts of spending and saving and lending and borrowing are analogous to the flow of blood in the circulatory system of the body. We want to study how the flow of money and credit extension (borrowing and lending) affects the well-being of households, business firms, and the overall economy. By focusing on borrowing and lending money and on spending and saving, we will see how the major sectors of the economy interact to produce goods and services and to generate income.

The health of the U.S. economy varies over time. At times, the economy appears to be well and functioning normally; at other times, it appears listless and depressed; at still other times, it seems hyperactive—characterized by erratic, unstable behavior. By studying how all the key parts of the economy fit together, we should be able to learn something about the illnesses that can strike this patient. What causes a particular type of illness (say, inflation or unemployment)? How is the illness diagnosed? What medicines or cures can be prescribed? If more than one treatment is possible, which will work best? Are any undesirable side effects associated with particular prescriptions? Are the doctors who diagnose the problems and administer the treatment (the policy makers) ever guilty of malpractice?

All these questions depend in part on "what makes the patient tick" and how we define "good health." A human patient's health (or lack of it) is determined by the deviations, if any, from a well-established set of precise criteria involving body temperature, reflexes, blood chemistry, appetite, and so forth. For the economy, however, we have no well-established, precise criteria that allow us to judge its health. Rather, loosely defined

1-5
The Influence of the Fed's Monetary Policy



goals or objectives such as "full" employment or "low" inflation are used. If everyone agrees on these goals, including how to define and measure them, and the economy seems to be operating in the neighborhood of the goals, then we might say that the economy is in good health. If we are heading toward the goals, we would say that the economy's health is improving. If the economy seems to be deviating from the goals, we would say that its health is not good and that prescriptive measures may be necessary to improve matters.

THE ROLE OF POLICY: CHANGING VIEWS

Business Cycle
Short-run fluctuations in economic activity as measured by the output of goods and services.

Expansion
The phase of the business cycle in which economic activity increases and unemployment falls.

Recession
The phase of the business cycle in which economic activity decreases and unemployment rises.

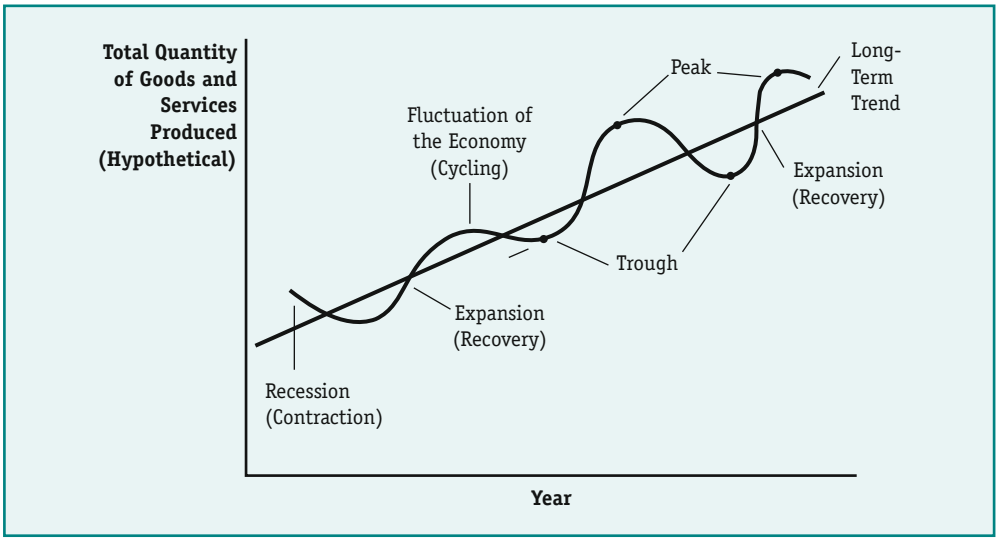
Fiscal Policy
Government spending and taxing decisions to speed up or slow down the level of economic activity.

Good health for the economy, as for humans, has both short- and long-run dimensions. Over the long run, we and policy makers would like to have the economy grow such that the quality of life and standard of living for an increasing population can improve. In the short run, we would like to minimize the fluctuations or deviations from the long-run growth path. In economics these short-run fluctuations of the economy are part of what is appropriately called the **business cycle.** Exhibit 1-6 illustrates the various stages of the business cycle and shows how they are related to the longer-run growth of the economy. The economy, like most of us, has its ups and downs. During a recovery or **expansion,** economic activity—as measured by the total quantity of goods and services being bought and sold—increases and unemployment falls. During a **recession** or contraction, economic activity decreases and unemployment rises. Just before the peak, all is bright and the economy/patient seems truly healthy. At the trough, all is bleak and the economy/patient appears quite ill. Over the longer run, we can calculate the average growth rate (trend), which smoothes out the expansions and contractions.

The key question is whether policy makers can, in fact, "manage" the economy successfully. Can they use monetary policy to minimize the short-run fluctuations of the economy over its long-run growth path? Can they use government spending and taxing decisions (**fiscal policy**) to speed up or slow down economic activity as needed? Can they, over time, change the growth rate of output? Because a look at the historical record does not provide an encouraging answer to this question, the appropriate role of policy in a complex modern economy is uncertain.

The medical profession requires considerable study and knowledge of causes and possible treatments before practitioners can diagnose and deal with an ailment. In eco-

1-6
Long-Run Economic Growth and the Business Cycle



nomics, despite the best efforts of eminent researchers, we still do not know how to cure some diseases; cures for all the economic ills we may encounter are simply not known.

Why are the goals that policy makers are trying to achieve so elusive? The answers are complex and fall into three possible areas.[9] First, the diagnosticians may not understand all the causes of the problems. What this really means is that we do not fully understand how the economy functions. Second, policy makers may be reluctant to use the currently known medicines to treat the patient because they have undesirable side effects, which may, in fact, be worse than the disease. Third, the cure for the problem may not yet be known, so more research will be needed to find a useful therapeutic approach. Thus far, we have assumed that the economy's illness can be cured only by doctors and their medicines. But could the patient get better without outside intervention?

Before the Great Depression of the 1930s, many economists tended to see the economy as inherently stable, having strong self-correcting tendencies. The prevailing belief was that the economy would never drift away from full-employment equilibrium for long; any disturbance or shock that pushed the economy away from full employment would automatically set in motion forces tending to move it back to full-employment equilibrium.[10] There was no need for corrective government action, then, because any movement away from equilibrium would be temporary and self-correcting. This view of the economy provided an economic rationale for the government to pursue a **laissez-faire,** hands-off policy.

Laissez-Faire
The view that government should pursue a hands-off policy with regard to the economy.

The Great Depression altered this view of the economy's internal dynamics. Between 1929 and 1933, the unemployment rate increased from about 3 percent to about 25 percent. The downturn was experienced worldwide and persisted until the start of World War II. Few could argue, in the face of such evidence, that the problem was correcting itself. The economist John Maynard Keynes and others suggested that once the economy's full-employment equilibrium was disturbed, its self-correcting powers were likely to be overwhelmed by other forces. The net result would be that the economy could operate below full employment for some time.

This new perspective gave the government an economic rationale for attempting to stabilize overall economic activity. A consensus formed that a highly developed market economy, if left to itself, would be unstable. As a result, "activist" stabilization policy has been practiced by both Democratic and Republican administrations since the mid-1930s. Until the early 1980s, there had been relatively little debate about whether the government should intervene. Rather, the debate was about when, how, and to what degree the government should use its policies to help reestablish a full-employment, low-inflation equilibrium.

However, the economy's performance in the 1970s and the early 1980s gave rise to doubts about the government's ability to stabilize the economy. As Exhibit 1-7 shows, the growth trend of the economy was below that achieved in the 1960s, and the fluctuations around the trend were quite large. The unemployment and inflation rates were both higher in the 1970s and early 1980s than they had been in the 1960s. These developments raised many questions. Does the government know how to proceed to restore the patient's health? If it acts without adequate knowledge, can policy make things worse rather than better? Many people reverted to the pre-Depression view that "less government intervention in the economy is better." But reducing the role of government may be difficult. Attempts to do so in the 1980s resulted in larger government deficits, not less government.

Although the economy experienced healthy growth from about 1983 until the late 1980s, many believed that this growth was produced by large government deficits and increases in military spending. Chronic trade deficits, problem loans to less-developed countries, troubles within the savings and loan industry, and the collapse of the junk bond market were of concern to many.

1-7
Average Inflation, Unemployment, and Growth During Recent Decades

	Inflation	Unemployment	Growth (Output)
1960s	2.4%	4.75%	4.4%
1970s	7.0	6.25	3.2
1980s	5.5*	8.25	2.8
1990s	3.3	5.7**	3.7
2000–2008***	1.7	4.66	2.4

*Actually, if the early 1980s are not considered, inflation averaged just under 4 percent for the remainder of the decade.
**From mid-1997 through the rest of the decade, unemployment was below 5 percent.
***Annualized through second quarter 2006. Actually, after the second quarter of 2008, prices fell and there was moderate deflation (falling overall prices) for the remainder of the year. Unemployment also surged in the second half of 2008.

The recession of the early 1990s caused anxiety, not because of its depth or length, but because the recovery was so sluggish. Growth remained lethargic well into the first half of 1993. However, by early 1994, economic growth had accelerated and remained high throughout the remainder of the decade while inflation remained subdued. Toward the end of the 1990s, the long expansion resulted in an unemployment rate of 4 percent—the lowest rate in over 30 years. Surprisingly, there was little or no acceleration of inflation.

Stock and bond prices experienced extraordinary increases from the mid-1990s into early 2000, even though Alan Greenspan, then the Fed chair, voiced concern in December 1996 that an "irrational exuberance" was taking over in these markets. Despite a moderate correction of stock prices in October 1997, the stock market again closed at a record high in July 1998. To some, the Asian Crisis of 1997 meant good news for the U.S. economy, which was believed to be less likely to overheat. By late summer 1998, stock prices finally succumbed to the international financial problems. Stock prices plummeted about 20 percent, and questions surfaced about whether the U.S. economy could withstand a global downturn. The Fed responded by lowering interest rates three times in the fall of 1998. The fiscal year ended on September 30, 1998, with a widely publicized federal government budget surplus of $70 billion—the first surplus since 1969. By the end of calendar year 1998, lower interest rates had the desired effect, and the stock market rebounded strongly to new highs.

The economy continued to expand into the new millennium with the stock market reaching record highs in March 2000. However, there were clouds on the horizon that suggested the record-long expansion could not last forever. From March 2000 on, the technology-dominated NASDAQ index of stock prices plummeted, losing over 50 percent of its value by December 31, 2000, and the DOW, the best-known index of stock prices, ended the year 2000 down and continued to collapse in one of the worst bear markets in history. Worries that the economy was heading steeply down caused the Fed to take action to lower interest rates in early January 2001.

Many factors continued to threaten the record expansion, including falling profits, the prolonged effects of the bursting of the stock market bubble, escalating energy prices, announcements of significant layoffs, and drops in consumer confidence. The attack on the World Trade Center and the Pentagon in September 2001 resulted in further economic turmoil, and the U.S. government announced that a recession had actually begun in March 2001. All in all, the Fed took action to lower interest rates thirteen times from January 2001 through June 2003. During this time, rates went down to 45-year lows. Although the recession officially ended in November 2001, the economy languished

in a jobless recovery throughout 2003. A large tax cut and a weak economy caused tax revenues to decline, while wars in Afghanistan and Iraq caused expenditures to balloon. The short-lived government surplus became a record government deficit.

By early 2004, the expansion had picked up pace, and the Fed's aggressive monetary policy continued to foster robust employment growth. In mid-2004, the Fed became concerned about inflation and began taking action to raise interest rates. By June 2006, the interest rate the Fed controls had been increased seventeen times to 5.25 percent. The Fed then held rates steady until September 2007. At that time, it became clear that the housing collapse and high oil prices were contributing to the severest financial crisis since the Great Depression and the Fed began what would be a long series of interest rate cuts. This aggressive action by the Fed was fostered by record collapses or the need for government bailouts of many large financial firms such as Countrywide, Bear Stearns, Indy Mac Bank, Lehman Brothers, Merrill Lynch, Fannie Mae, Freddie Mac, the American International Group (AIG), and Washington Mutual. In late September 2008, Congress, at the urging of the Treasury, the Fed, and President Bush, passed the largest government bailout plan in history for the financial system. Under the plan, the government would inject up to $700 billion into financial markets to mitigate the crisis. The series of interest rate cuts by the Fed continued until December 2008. At that time, the target for the interest rate the Fed controls was at 0 to .25 percent—an historic low. Despite falling oil prices in late 2008, the economy had shed 2.6 million jobs in 2008, the unemployment rate soared, and many feared the economy was plunging into the worst downturn since the Great Depression. The major domestic automakers, on the doorstep of bankruptcy, requested and received a bailout from the government. The crisis continued to deepen in early 2009 and newly sworn-in President Obama promised an even bigger bailout to get the economy going again. The new administration also promised regulatory reforms to prevent such a catastrophic crisis in the future.

One thing is clear: monetary policy makers and those affected by changes in the financial environment—each of us—will make better decisions if we understand the concepts of money and credit extension and their effects on the financial system and the economy.

Summary of Major Points

1. Economics is concerned with how, given people's unlimited wants, scarce resources are allocated among competing uses, how income is distributed, and how people allocate their incomes through spending, saving, borrowing, and lending decisions.
2. Finance focuses on the financial side of these decisions—that is, the raising and using of funds by households, firms, and governments.
3. The financial system coordinates and channels the flow of funds from lenders to borrowers and creates new liquidity for an expanding economy. The characteristics of this process have changed over time as innovations and changes in regulations have occurred.
4. Spending units that spend less than their current income on consumption and investment are called *net lenders.* Spending units that spend more than their current income are called *net borrowers.*
5. In allocating funds among the various types of financial assets available, net lenders are concerned about the expected return, the risk of loss, and the liquidity associated with acquiring and holding a particular asset.

6. Direct finance involves lending directly to net borrowers. Indirect finance involves lending to a financial intermediary, a type of financial institution that borrows in order to re-lend. Financial intermediaries issue claims on themselves. The lenders receive financial claims on the financial intermediaries, and the borrowers receive funds from the financial intermediaries.
7. Financial intermediaries exist because they help to minimize the transactions costs associated with borrowing and lending. The financial services provided include appraising and diversifying risk, offering a menu of financial claims that are relatively safe and liquid, and pooling funds from individual net lenders.
8. The most important types of financial intermediaries are the depository institutions: commercial banks, savings and loan associations, mutual savings banks, and credit unions. These institutions are central to the process of determining the nation's money supply. Other types of financial intermediaries are life and casualty insurance companies, pension funds, mutual funds and money market mutual funds, and finance companies.
9. The Federal Reserve is a quasi-independent government agency that serves as our nation's central bank. Its regulatory policy is aimed at promoting a smooth-running, efficient, competitive financial system. The Fed's monetary policy, which influences interest rates and the volume of funds available for borrowing and lending (credit extension), is directed at enhancing the overall health and stability of the economy. Although the Fed works primarily through depository institutions, its influence spreads from depository institutions to the financial system.
10. Views on the appropriate role of policy in the economy have varied over time. Throughout the middle and late 1980s, the economy experienced healthy growth that was accompanied by large trade and government deficits. After a recession in the early 1990s, economic growth resumed, and the economy achieved both low inflation and low unemployment with a record-long expansion into the new millennium. A recession had actually begun in March 2001, and although it officially ended eight months later, the recovery remained sluggish through 2003 despite aggressive expansionary monetary policy by the Fed. The recovery picked up steam in 2004, and the Fed took action to increase interest rates until mid-2006, when the possibility of a downturn again seemed on the horizon. Rates were held steady until September 2007. At that time, it became clear that the housing collapse had caused a severe crisis in the financial sector and the Fed responded by cutting interest rates to historic lows. This aggressive action by the Fed did not stop record collapses or government bailouts of many large financial firms and the largest financial bailout of the financial system in history. In early 2009, President Obama promised an even bigger bailout package to get the economy going again. Many feared the economy was plunging into a catastrophic downturn.

Key Terms

Business Cycle, p. **14**
Checkable Deposits, p. **11**
Default, p. **10**
Depository Institutions, p. **11**
Deregulation, p. **5**
Direct Finance, p. **8**
Economics, p. **4**
Expansion, p. **14**
Federal Reserve, p. **12**
Finance, p. **4**
Financial Claims, p. **9**
Financial Institutions, p. **8**
Financial Intermediaries, p. **8**
Financial Markets, p. **8**
Fiscal Policy, p. **14**
Indirect Finance, p. **8**
Laissez-Faire, p. **15**
Liquidity, p. **10**
Macroeconomics, p. **4**
Microeconomics, p. **4**
Monetary Policy, p. **13**
Money, p. **6**
Net Borrowers, p. **7**
Net Lenders, p. **7**
Recession, p. **14**
Saving, p. **6**
Transactions Costs, p. **10**

Review Questions

1. Provide a short discussion or definition of the following terms: *economics*, *finance*, *the financial system*, *net lenders*, *net borrowers*, *direct and indirect finance*, *financial markets*, *financial intermediaries*, *liquidity*, *business cycle*, *depository institutions*, and *monetary policy*.
2. Some people have money; some people need money. Explain how the financial system links these people together.
3. Discuss the statement: "Since I have high credit card limits, I have lots of money." Are credit cards money? Why or why not? (*Hint:* See Endnote 2.)
4. When are the surplus funds I have available to lend in financial markets equal to my saving?
5. Why do financial intermediaries exist? What services do they provide to the public? Are all financial institutions financial intermediaries?
6. What are transactions costs? Does financial intermediation increase or decrease transactions costs?
7. What is a depository institution? What is a checkable deposit? How does a depository institution differ from other intermediaries? Give three examples of depository institutions.
8. Why does the Fed monitor the economy? What actions can the Fed take to affect the overall health of the economy?
9. Why have views changed concerning the appropriate role of stabilization policies in managing the economy? Briefly discuss the historical evolution of these views.
10. What are the pros and cons of lending to my next door neighbor rather than putting my surplus funds in a bank?
11. Define *laissez-faire* and *fiscal policy*. Who determines fiscal policy? Who determines monetary policy?

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

12. Rank the following assets in terms of their liquidity, from least to most liquid: cash, savings deposits, gold, a house, a rare oil painting, a checkable deposit. Explain your rank order.

✓13. Is each of the following an example of direct or indirect financing?

   a. John purchases stock from the biotech firm that employs him.
   b. Mary purchases a newly issued government security.
   c. John places $3,000 in a savings account at the local savings and loan.
   d. John receives a loan from Mary.
   e. John receives a loan from Friendly Savings Bank.

✓14. Bill's income is $4,000. He spends $3,000 on consumption and $300 on an investment in a newly constructed house. He acquires $700 in financial assets. What is his saving? What is the amount of surplus funds he has available to lend?

✓15. A firm spends $100,000 on investment in plant and equipment. It has available funds of $30,000 and borrows the additional funds from a bank. Is the firm a net borrower or a net lender? What is the amount of the surplus or deficit?

✓16. Diane Weil earns wages of $45,000 and interest and dividend income of $5,000. She spends $8,000 as a down payment on a newly constructed mountain cabin and lends $4,000 in financial markets. Assuming that Diane spends the remainder of her income on consumption, what is her saving? Is she a net lender or net borrower? What is her consumption?

✓17. Tech Corp had gross sales of $9 million and total expenses of $8.5 million. Assume that Tech wants to undertake a capital investment of $1 million. What is the minimum amount of bonds it would have to issue to do so? Assume that Tech pays out $300,000 in dividends. Now what is the minimum amount it would have to borrow?

✓18. What are the phases of a business cycle? Draw a graph of a typical business cycle and label the various phases.

✓19. The *misery index* is defined as the sum of the unemployment and the inflation rates. Use Exhibit 1-7 to calculate the misery index for each decade since 1960.

Suggested Readings

If the material covered in the text is to come alive and make sense to you, we suggest you try to read *The Wall Street Journal* and *Business Week* regularly. In fact, hardly a day goes by without a report on an issue that is in some way relevant to our subject. You might also consult *The New York Times*, *The Washington Post*, or *The Los Angeles Times;* all have good financial sections. Or you can browse the financial sections of *USA Today* (**http://www.usatoday.com**) or CNN (**http://www.money.cnn.com**) on the World Wide Web.

The *Federal Reserve Bulletin* presents policy issues of concern to the Board of Governors. Since 2006, *Federal Reserve Bulletin* articles have been published on the World Wide Web at **http://www.federalreserve.gov/pubs/bulletin/default.htm** as they become available.

A plethora of financial statistics can also be found in the Federal Reserve Bank Economic Database Web site (**http://www.research.stlouisfed.org/fred2/**).

A wealth of information about the current state of the economy and attempts at stabilization by the government can be found in *The Economic Report of the President*. It is published annually during the month of February by the U.S. Government Printing Office and is available at the reference desk of most libraries. It is also available on the Internet at **http://www.access.gpo.gov/eop/**.

The Statistical Abstract of the United States contains summary data on income, expenditures, wealth, prices, and the financial system (among other things). It is published annually during December by the Census Bureau of the U.S. Department of Commerce. *The Statistical Abstract* is also available at the following Census Bureau Web page: **http://www.census.gov/compendia/statab/**.

The Survey of Current Business, published monthly by the Bureau of Economic Analysis, Department of Commerce, contains current business and income statistics. It is available on the World Wide Web at **http://bea.gov/scb/index.htm.** For a brief history of the Federal Reserve, go to **http://www.minneapolisfed.org/info/sys/history/**.

For more on monetary policy, see **http://www.minneapolisfed.org/info/policy/**.

For more information about business cycle expansions and contractions, see **http://www.frbsf.org/education/activities/drecon/2002/0205.html**.

Endnotes

1. When economists use the term *capital* in this context, they mean machinery and equipment that are used to produce other goods and services. For example, a sewing machine that produces shirts is capital.
2. Credit cards are not money. When a credit card is used, the user is taking out a loan by authorizing the institution that issued the credit card to make a payment with money on his or her behalf. Ultimately, the individual must pay credit card balances with money.
3. As used here, *investment in houses* refers to expenditures for new residential construction, where a service is rendered over a period of time.
4. Firms also make investment expenditures to replace worn-out capital.
5. There is another option. If we owe back debts, we could employ surplus funds to pay off those debts.
6. If we have only a small amount of surplus funds available, it may be extremely difficult to diversify to a significant extent. As we shall see in later chapters, small investors can use mutual funds to accomplish this objective.
7. The Federal Deposit Insurance Corporation (FDIC) enables the public to feel confident that funds deposited in a bank or savings and loan, up to a limit (currently $100,000), are safe. If the institution fails, the FDIC will step in and pay off the depositors. When financial institutions were failing daily during the early years of the Great Depression in the 1930s, the government became convinced of the pressing need for such an agency. See **http://www.fdic.gov/**.
8. Examples of very large nonfinancial institutions that have entered the lending business include General Electric (GE), Sears, and General Motors (GM), all of which now issue credit cards.

9. The complex answers are tackled in Part Six of the text.
10. *Equilibrium* is a concept used by economists to help analyze the economy. It refers to a state of the economy from which there is no tendency to deviate—a state of rest. Of course, in reality, the economy is constantly being bombarded with disturbances and is hardly ever "at rest." The concept of equilibrium, then, is an analytical device that helps us sort out the influences of many different factors, which, in the real world, are often all changing at the same time.

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CHAPTER TWO

2

Money is like muck—not good unless you spread it.

—Francis Bacon

Money: A Unique Financial Instrument

Learning Objectives

After reading this chapter, you should know:

What the functions of money are

How the Fed defines the monetary aggregates M1 and M2 and the credit aggregate domestic nonfinancial debt (DNFD)

The evolution of the payments system

How the demand and supply of money influence the interest rate

How, in general, changes in money and credit influence the level of economic activity

CONCEPTUALIZATION: A KEY BUILDING BLOCK

As the week ends in the dormitory dining hall, Mary, the dining hall supervisor, calls Randy, the dishwasher, over and gives him his pay envelope. It should contain $50. Finding the envelope somewhat thicker than normal, Randy opens it and discovers five $10 tickets to the university's spring play next Saturday night. Tired and somewhat irritated, especially since he has already seen the performance, he tells Mary he wants money, not these tickets. Mary tries to persuade Randy to accept the tickets instead but fails and eventually produces a university check made out to Randy for $50.

A simple story. Yet it touches on most of the key issues addressed in this chapter: Why did Randy want money instead of the tickets? Why does he accept the check? Why aren't the tickets money? Why aren't they as good as money? As we shall see, the term *money* is used rather sloppily in everyday language.

The purpose of this chapter is twofold: first, to nail down the definition of money, and, second, to introduce money's importance, not only for Randy, but for the economy as a whole.

DEFINING MONEY

A good definition enables us to separate the thing being defined from all other things. Economists define *money* in terms of its specific functions within the financial system—by what it does. By specifying precisely what it does, we can distinguish money from everything else we observe in the financial system, even those things that at first glance appear quite similar. Of particular interest is what makes money unique: What does it do that other things do not?

Money
Anything that functions as a means of payment (medium of exchange), unit of account, and store of value.

Means of Payment (Medium of Exchange)
Something generally acceptable for making payments.

Barter
Trade of goods for goods.

Double Coincidence of Wants
A bartering situation in which each person involved in a potential exchange has what the other person wants.

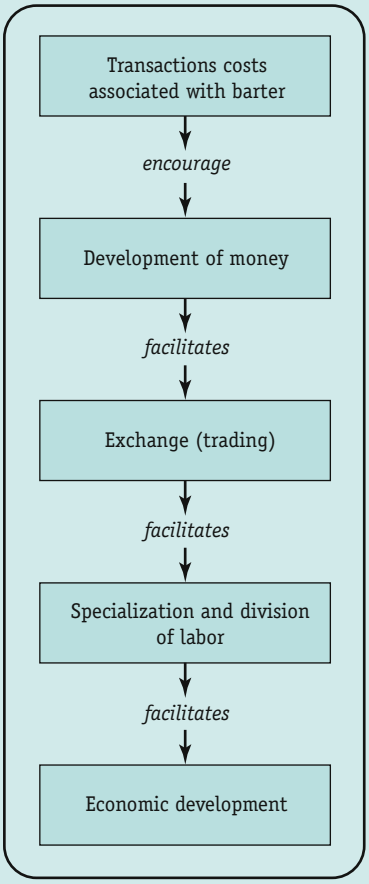
The primary function of **money,** and the function that distinguishes it from all else in the financial system, is that it serves as a generally acceptable **means of payment,** or **medium of exchange.** As Chapter 1 stated, money is what we generally use to make payments and, thus, what is generally accepted as payment. The importance of money's function as a means of payment is so obvious that it is often overlooked.

Imagine a world without money where all goods were exchanged or traded by **barter**—by trading goods for goods. If you worked in a computer factory, you might be paid in keyboards, which would not only be difficult to exchange for other goods and services but also rather cumbersome to carry around. To buy groceries, for example, you would have to persuade the grocer to accept your keyboards for payment. There would be no reason for the grocer to do so, unless she had a use for additional keyboards or knew someone else who did. Finding such a **double coincidence of wants,** the situation when the grocer has what you want (groceries) and you have what she wants (keyboards), would often be extremely difficult. Thus, exchange under a barter system is costly in terms of search time—the time spent looking for someone who has groceries and wants computer keyboards. In general, the time and effort associated with barter make it a cumbersome and inefficient way to conduct transactions. It raises transactions costs, which are all costs involved with making exchanges. In turn, higher transactions costs hold down the volume of exchange in the economy.

This is why barter economies tended to be mostly agricultural. With the volume of trade relatively low and exchanges costly to carry out, one could never be sure of finding a double coincidence of wants. As a result, almost everyone produced the food and other items they needed to survive so that very few exchanges would be necessary. If some individuals decided to specialize and trade, they had an incentive to produce the goods that were easiest to trade rather than the goods that they were best at producing. For efficiency to occur, people should specialize in what they can most efficiently produce, which is ex-

Money, Exchange, and Economic Development

Most of us take for granted the existence of money; we have never experienced a barter system. How and why economies evolved from a primitive barter system to an advanced monetary system is a long story. The short, somewhat simplified version is that the high costs of barter exchange provided an economic incentive for people to devise a better system. Important in the early evolution of the system were the merchants who established trading posts or general stores. They purchased goods from farmers, often paying for the goods with a receipt that the farmer could later use at the store to purchase other items that the merchant had acquired from other farmers. The receipts were an early form of money, as were the gold and silver nuggets that also came to be exchanged for goods and services at the trading posts and elsewhere. Eventually, as governments developed and the benefits of standardizing the money within an economy became apparent, governments came to produce and certify coins and paper notes (currency) as money.



By eliminating the need for a double coincidence of wants, the existence of money dramatically reduces the costs of conducting trade, thereby encouraging a larger volume of exchange. With more opportunities for exchange, it is no longer necessary for all of an economy's participants to individually produce the same goods to survive and prosper; because exchanges are faster and easier, labor time is not wasted in the trading process. People can now more easily specialize in the production of goods to which they are relatively best suited, trade these goods for money, and use the money to purchase goods produced by others. The development of the financial system and the resulting division of labor (and other resources) into the production of an increasing variety of goods are key ingredients in the process of economic development. The accompanying schematic diagram ties these several thoughts together.

actly what "money" in an economy encourages. Because money encourages specialization and trade, money is important in facilitating economic growth and development.

Fortunately, finding a double coincidence of wants is not necessary in today's economy because we do have something that serves as a generally acceptable means of payment—money. As a result, people can exchange goods and services for money and

vice versa. To illustrate, Randy, the dishwasher, planned to exchange a week's labor for $50 and the $50 for groceries. If Randy had accepted the tickets—a type of barter transaction—he could not have eaten until he found a grocer who wanted tickets to the play. If he failed to do so by curtain time on Saturday, Randy would find that the tickets had become worthless and he would go hungry for the next week. A monetary exchange eliminates the need for a double coincidence of wants and thus facilitates trade by reducing the transactions costs involved.

Store of Value
Something that retains its value over time.

Something that becomes generally acceptable as a means of payment in exchange for goods and services will necessarily also function as a **store of value.** To be acceptable, something must store value or, more specifically, purchasing power, because people receive money and spend it at different points in time. In other words, there is a difference between the time people receive money and the time they spend it. If you are paid for your labor services today and do not need to purchase anything until tomorrow, you would presumably be unwilling to accept anything in payment that is likely to decline in value before you spend it. (Could Randy have sold the tickets to the play for $50 on Sunday, the day after the performance?) Conversely, people will accept something as a means of payment for goods and services when they believe they can easily exchange it for something else of like value in the near future.

We now know that money functions as a means of payment and store of value and what these functions mean. For monetary exchange to proceed in an orderly fashion, however, there must be some method of specifying the amount of money required to pay for a given quantity of a particular good. In other words, there is a need for an accounting unit, commonly referred to as a *unit of account*. Because all domestic prices and financial records, including debts, in the United States are expressed in dollars, the dollar serves as our monetary **unit of account**—it is the standard measure of value. To appreciate why it is convenient to have a standardized unit of account, imagine the poor grocer and the grocer's customers who, in the absence of money and a unit of account, would have to remember that one computer keyboard equals one gallon of milk, one crate of oranges equals three pounds of cheese, and so forth. A unit of account facilitates actual transactions throughout the economy by making it possible to compare the relative values of different goods and services and to keep records about prices and debts. Thus, $4 equals one gallon of milk or three pounds of cheese.

Unit of Account
A standardized accounting unit such as the dollar that provides a consistent measure of value.

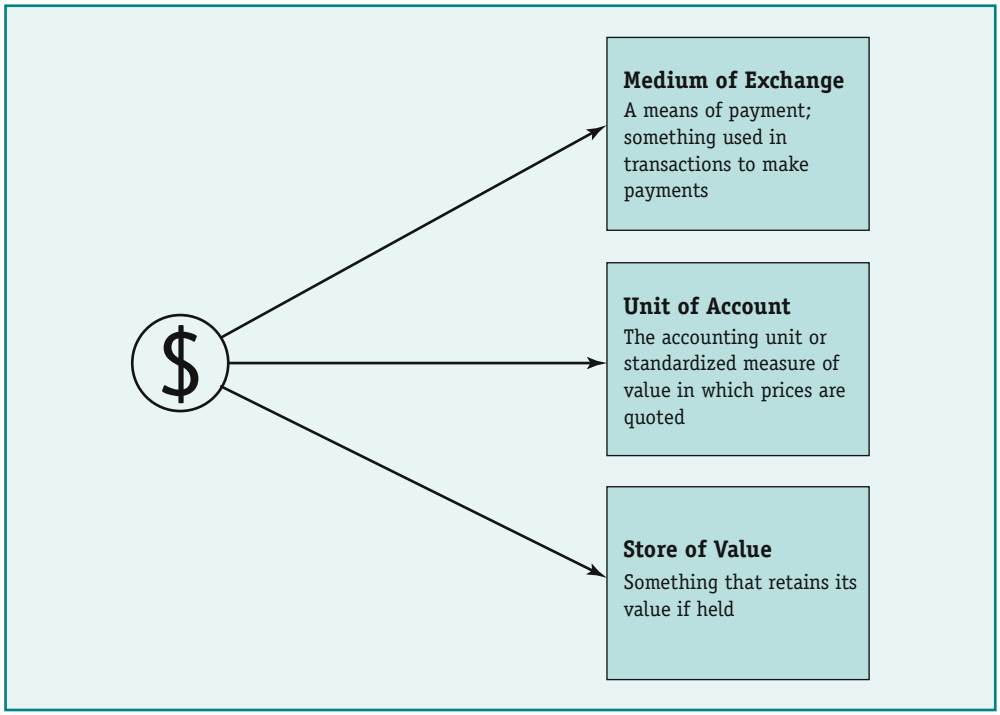
In sum, money is whatever circulates in a modern economy as a generally acceptable means of payment. By necessity, money will also function as a store of value, and its unit of measurement will naturally become the unit of account and measure of value. The functions of money are portrayed in Exhibit 2-1.

Recap Money can be defined by its functions. Money is anything that functions as a means of payment (medium of exchange), a unit of account, and a store of value. Money is acceptable in payment for goods and services.

THE MONETARY AGGREGATES AND DOMESTIC NONFINANCIAL DEBT

Given our definition, measuring the quantity, or stock, of money in an economy should be straightforward: add together those things that function as a means of payment. In reality, measurement is not quite so simple. There are at least two difficulties. First, what functions as a means of payment in an economy will change over time, so what is considered money will need to be revised as the economy's financial system evolves.

2-1
The Functions of Money



Money Market Deposit Accounts (MMDAs)
Financial claims with limited check-writing privileges, offered by banks since 1982; they earn higher interest than fully checkable deposits and require a higher minimum balance.

Monetary Aggregates
The measures of money—including M1 and M2—monitored and tracked by the Fed.

M1
Currency in the hands of the public plus checkable deposits.

M2
Everything in M1 plus other highly liquid assets.

Checkable Deposits
Deposits that are subject to withdrawal by writing a check.

Demand Deposits
Non-interest-earning checking accounts issued by banks.

For example, gold and silver coins were once money. Now they have been replaced by paper currency, coins made out of nonprecious metals, and checkable deposits. Second, some things may be difficult to classify; that is, some financial claims are on the borderline between being and not being a means of payment. For example, **money market deposit accounts (MMDAs)** that are issued by some depository institutions have limited check-writing privileges—up to three checks per month. MMDAs earn higher interest than most checking accounts and generally require a higher minimum balance. Because of the limited check-writing privileges, MMDAs have some characteristics of checking accounts even though they are primarily used as savings accounts by most individuals.

Monetary aggregates are collections of monetary assets. Today, the Fed keeps track of and monitors two monetary aggregates (M1 and M2). Changes in the monetary aggregates can provide useful information about how well the economy is doing. Exhibit 2-2 shows the composition of **M1** and **M2.** The aggregates comprise several different types of financial assets. Some items clearly serve as a means of payment (currency and checkable deposits), some are clearly not means of payment ("small" time deposits), and some are in between (money market deposit accounts).

The measure that *currently* corresponds most closely to the definition of money is M1. It consists of currency held by the public and checkable deposits.[1] Currency in the United States is issued by the U.S. Treasury and circulated by the Fed. **Checkable deposits** are deposits that can be withdrawn by writing a check to a third party. They consist of 1) **demand deposits,** which are non-interest-earning checking accounts issued by banks, and 2) other checkable deposits, which are interest-earning checking accounts issued by some depository institutions.

M1 contains the "monetary" assets that we use in transactions, and it is generally what we have in mind throughout the text when we refer to the *money supply*. All components of M1 are means of payment (transactions money).

2-2

The Monetary Aggregates and Domestic Nonfinancial Debt as of September 30, 2008 (in Billions of Dollars, Seasonally Adjusted)

M1 =	
Currency in the hands of the public	$780.1
Demand deposits at commercial banks	351.9
Other checkable deposits (deposits that can be withdrawn by unlimited check writing)	316.1
Travelers' checks	5.8
Total M1*	**$1,453.8**
M2 =	
M1 plus	$1,453.8
Small savings deposits (less than $100,000) including money market deposit accounts	$4,033.5
Small time deposits (less than $100,000)	1,256.0
Individual money market mutual funds	1,026.2
Total M2	**$7,769.4**
DNFD =	
Government Debt	
Credit market debt of the U.S. government	$5,822.7
Credit market debt of state and local governments	2,231.3
Non-Government Debt	
Corporate bonds	3,703.8
Mortgages	14,559.0
Consumer credit (including bank loans)	2,590.5
Other bank loans	1,649.1
Commercial paper	401.8
Other debt instruments	2,021.3
Total DNFD	**$32,979.5**

*Components may not sum to total because of rounding.
Source: **www.federalreserve.gov**

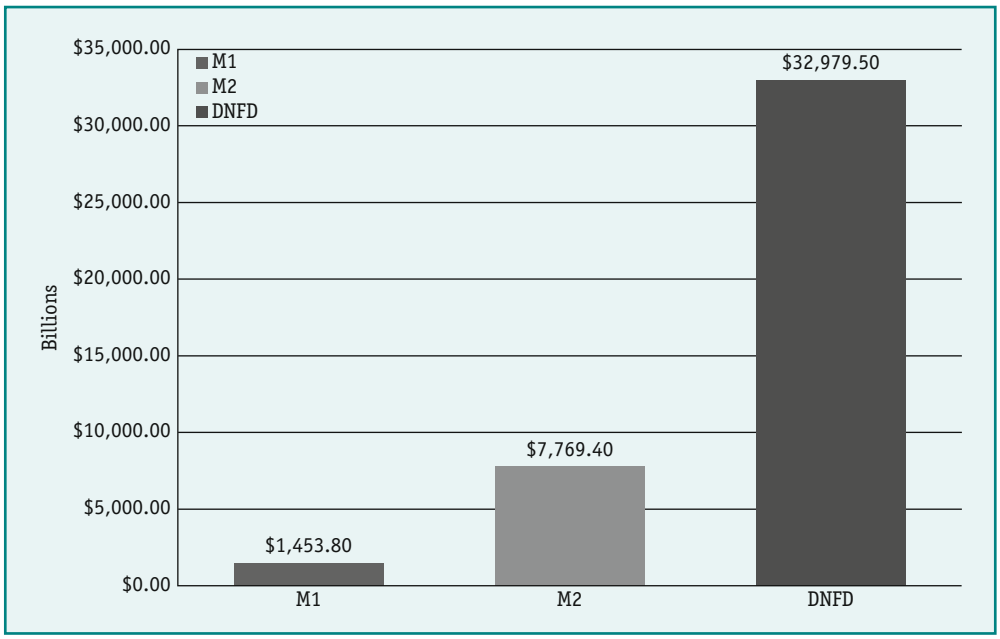
M2 consists of everything in M1 plus some other highly liquid assets which can be converted to the items in M1 very easily without loss of value for the principal. The other highly liquid assets included in M2 are small savings and time deposits, MMDAs, and individual money market mutual funds (defined in Chapter 4). Even though these other assets are not used to make transactions, because they are all highly liquid, they are often referred to as **near monies.**

Near Monies
Highly liquid financial assets that can easily be converted to transactions money (M1) without loss of value.

Because information about credit market activity can also provide useful information about the economy, the Fed keeps track of a broad measure of outstanding credit. This aggregate is **domestic nonfinancial debt (DNFD),** which includes outstanding loans and debts accumulated in the present and past years. Take another look at Exhibit 2-2 for the components of DNFD. Items included in DNFD are such things as outstanding government debts, corporate bonds, mortgages, consumer credit, other banks loans, and commercial paper, which is defined in Chapter 3. Unlike the items included in M1 and M2, the components of DNFD are not money or near monies.

Domestic Nonfinancial Debt (DNFD)
An aggregate that is a measure of total credit market debt owed by the domestic nonfinancial government and private sectors.

2-3
The Relative Size of the Monetary Aggregates and DNFD as of September 30, 2008 (Seasonally Adjusted)



Specifically, DNFD refers to total credit market debt owed by the domestic nonfinancial sector, including the U.S. government, state and local governments, private nonfinancial firms, and households. Don't let the length of this definition confuse you. *Domestic* merely means U.S. entities, excluding foreign entities. *Nonfinancial debt* excludes the debt of financial institutions—those institutions that borrow solely to relend. The debt of financial institutions is excluded to avoid double counting.

For example, suppose Friendly Savings and Loan borrows surplus funds from small passbook savers and lends those funds to Jorge and Maria to buy their first home. If the debt of the financial institution were counted, both Jorge and Maria's mortgage debt and Friendly's debt to the passbook savers would be included in the aggregate. This would be double counting, because the ultimate transaction went from the passbook savers to Jorge and Maria with the savings and loan in between. Furthermore, Friendly's financial debt to the passbook savers is offset by the financial claim (mortgage) Friendly holds against Jorge and Maria.

Think of DNFD as a measure of the unpaid claims that lenders have against borrowers, excluding the debt of financial intermediaries. DNFD is probably the best measure of outstanding nonfinancial credit that we have. When credit flows increase, DNFD (the aggregate amount of debt outstanding) goes up. Likewise, when credit flows decrease, DNFD declines. Exhibit 2-3 shows the relative size of the monetary aggregates and DNFD. Exhibit 2-4 (p. 32) shows how the various aggregates have grown over time.

THE ECONOMY AND THE AGGREGATES

In the early and mid-1980s, M1 was the primary measure of money that the Fed watched. Targets were set for the growth rate of M1 that were thought to be consistent with the Fed's goal for the economy. The Fed monitored the targets to provide a barometer of economic activity. If M1 growth was above the target rate, the Fed would take actions that resulted in a slowdown in its growth, and vice versa. In either case, the goal

The Ongoing Evolution of the Payments System: The Role of Computer and Telecommunications Technologies

Payments Mechanism
The means by which transactions are consummated; that is, how money is transferred in an exchange.

Like the human race, the current financial system has evolved from a primitive state and will continue to evolve in the future. This tendency to change has been influenced significantly by the technology used to execute transactions. The payments mechanism is the means by which transactions are completed—that is, how money is transferred among transactors.

If someone now asked you what makes up the U.S. money supply, we hope you would answer "currency held by the public and checkable deposits, the primary components of M1." Checkable deposits are payable on demand to third parties. For example, if you write a check to your grocer, the first two parties are you and the depository institution; the grocer is the third party. The check in payment for goods purchased is an order for your bank to debit (subtract) a certain number of dollars from your checkable deposit account. The dollars are then credited (added) to the deposit account of the grocer, the third party. Thus, a checkable deposit is a means of payment, and the check is the method used to transfer ownership of the deposit between parties to a transaction. The point is that the check itself is not money; if it were, printing presses would work around the clock! The balances in checkable deposits are money.

Electronic Funds Transfer System
The transfer of funds to third parties in response to electronic instructions rather than a paper check.

Point-of-Sale Terminal
A computer terminal that uses a debit card to electronically transfer funds from a deposit account to the account of a third party.

Over the years, computer and telecommunications technologies have greatly altered the way in which payments are made. Technological innovations are making checks much less important, and perhaps soon obsolete as a means of transferring purchasing power. Today, we are making an increasingly larger percentage of payments through an electronic funds transfer system. In this system, payments are made to third parties in response to electronic instructions rather than instructions written on a paper check. Note that an electronic funds transfer system does not eliminate the need for deposit accounts; it is just a more efficient way of transferring funds from one deposit account to another. To pay your grocery bill, for instance, your account is debited by the amount of your bill, and the grocer's account is credited by the same amount at the time of the exchange. The whole system is computerized so that no written checks are necessary. All you need is an account number and a debit card that you present to the grocer. The grocer, in turn, enters the prices of your purchases into a computer terminal (called a point-of-sale terminal), and at the end of the month, you receive a statement giving your current balance and a record of all the charges and deposits to your account. This is just like a checking account statement, but without the checks.

Stored-Value Cards
Plastic cards that have a magnetic strip that is swiped through a card reader to make payments; usually single use.

Other forms of electronic funds transfer systems are stored-value cards and smart cards. Stored-value cards are plastic cards that have a certain amount of funds embedded on a magnetic strip. The owner of the stored-value card has paid to have the funds transferred to the card. Stored-value cards look like credit cards and are swiped through a card reader when the owner wants to access the funds. As the funds are spent, the balance on the card is transferred electronically from the card to the card reader. Gift cards from your favorite store are an example of stored value cards. Stored-value cards are popular on college campuses to pay for such things are photocopying in the library, meals in the dining hall, and parking fees. They are also used to prepay for toll roads and generally have a single use.

Smart Cards
Plastic cards with a microprocessor chip that are used to make payments; the chip stores information that allows the payment to be validated.

Smart cards are much more sophisticated than stored-value cards in that they have a microprocessor chip embedded in them that stores information and usually includes a "digital signature." The stored information leads to greater security for someone who accepts a smart card for a payment because the digital signature is verified. Each time the card is used, the amount of the payment is deducted electronically from the card and credited to the recipient of the payment by a point-of-sale terminal that is equipped to do so. At some point, the recipient transfers smart card payments from the point-of-sale terminal to its bank. If transferred immediately, the payment is completed in a matter of seconds. The microprocessor checks the authenticity of the transaction by examining the digital signature that is embedded in the chip. Although the validity is authenticated, the transaction is kept anonymous as if cash were used. Some smart cards are issued by and accepted by a single institution only. Other smart cards are accepted by multiple institutions and multiple retailers. Although they have not caught on to a large extent in the United States, smart cards offer the possibility of replacing cash and checks to make most payments because they may be more convenient and cheaper to use.

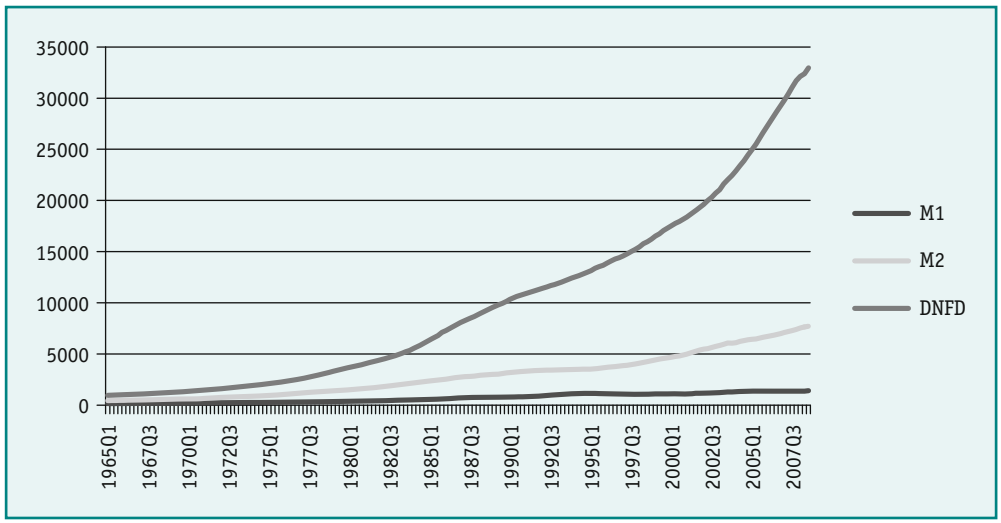
Currently, many employers, in cooperation with banks, pay salaries by automatically crediting their employees' bank accounts rather than by issuing the customary check. Such automatic credits, referred to as direct deposits, are also a form of an electronic funds transfer system.

Automated Teller Machine (ATM)
A machine that permits a depositor to make deposits and withdrawals to an account even when the financial institution is closed.

One of the best known and most popular forms of electronic transfer of funds is the **automated teller machine (ATM).** Your depository institution most likely has ATMs, which permit you to make deposits and withdrawals, even late at night when the institution itself is closed. In all probability, your college has several ATMs on campus. ATMs are also visible in grocery and convenience stores, at car washes, and at shopping malls. Recently, portable ATMs in vans have been established that can be moved to sporting event locations, concerts, and so on. As you may have guessed, the vans housing the ATMs have multiple security features that prevent theft. As the ownership of personal computers and modems has spread, it has become possible to conduct a large portion of one's financial transactions from home.

In conclusion, electronic funds transfer systems are nothing more than the application of computer and telecommunications technology to the entire area of financial transactions and services. The aim is to reduce the physical handling and labor costs associated with an ever-expanding volume of paper checks, deposit slips, and the like, as well as to provide increased convenience and service to the public. Transferring funds and making payments electronically is generally much cheaper than writing checks or using other paper instructions to transfer funds. The application of computer and telecommunications technologies thus greatly reduces the costs of making payments and improves the efficiency of the payments system. As questions regarding the privacy of financial records, security of the systems, and legal responsibilities are being resolved, new payments practices and electronic funds transfer systems are spreading rapidly. One thing is certain: In the future, more payments will be made electronically because they are cheaper and, in most cases, more convenient. The result will be further evolution in how money is used and, perhaps, changes in what functions as money. From barter to gold and silver coins to checkable deposits to electronic money, the evolution of money and the payments mechanism goes hand in hand with the development of an economy and computer and telecommunications technologies.

2-4
M1, M2, and DNFD Over Time



was to nudge the economy in the desired direction so that the objectives the Fed had set for the economy would be achieved.

During the late 1980s, M2 gained importance and prominence in the execution of monetary policy by the Fed. Throughout this period, the relationship between changes in M2 and economic activity seemed more stable than that between changes in M1 and economic activity. Consequently, the Fed watched the growth rate of M2 for signals about how well the economy was doing and deemphasized the role of M1. But in the early 1990s, the stable relationship between changes in M2 and changes in economic activity also seemed to break down. The growth rate of M2 moved in erratic and unpredictable ways. As a result, the Fed deemphasized the use of M2 as a policy indicator.

Beginning in the early 1990s, the Fed increasingly used changes in the growth rate of DNFD as an indicator of the direction of the economy. Changes in DNFD seemed, at least at that time, to have a stable relationship with changes in economic activity. If credit growth was increasing, then spending was likely to be going up. If credit extension was slowing, then the growth rate of economic activity was also likely to be slowing. By the late 1990s and continuing into the late 2000s, the Fed was using many other economic variables as barometers of economic conditions in addition to the monetary aggregates and DNFD. The monetary aggregates and DNFD were increasingly deemphasized in formulating policy and now are used primarily as informational variables along with many other indicators.

For our purposes, then, it is probably best to think of M1 as a measure of transactions money and M2 as a broader measure of money that, at times, has been closely related to economic activity. Likewise, DNFD, although not a monetary aggregate, is a broad credit aggregate that has also been closely related to economic activity and monitored by the Fed.

Recap

The Fed keeps track of two measures of money: M1 (transactions money) is currency in the hands of the public plus checkable deposits; M2 includes everything in M1 plus other highly liquid assets (near monies). In addition to M1 and M2, the Fed monitors DNFD, a broad measure of credit. DNFD includes public and private debt but excludes the debt of financial institutions to avoid double counting. Sometimes a given aggregate has been more highly correlated with the level of economic activity than at other times. Since the late 1990s, the monetary aggregates and DNFD have been deemphasized in monetary policy formulation.

Looking Back

Staying Ahead of the Counterfeiter

In the late 1990s, the United States issued redesigned currency (notes) for the first time since 1928. New $100, $50, $20, $10, and $5 bills featured larger presidential pictures (offset to the right), a colored security thread, color-shifting ink, and a watermark. By the late 1990s, technological innovations had made it easier for a counterfeiter to get reasonably good facsimiles of the old notes. The new notes were issued to make the currency more difficult to counterfeit. However, the new notes were not destined to have a long life of their own like their predecessors. In 2003, the United States issued another newly designed $20 bill; in 2004, a new $50 bill; in 2006, a new $10 bill; and in 2008, a new $5 bill. A redesigned $100 bill will follow. The newly designed notes have retained the features of the notes issued in the late 1990s but have additional safety measures, including faint shades of background colors. Different denominations have different background colors. For example, the new $20 bill has background colors of green, peach, and blue; the new $50 bill is red and blue; and the new $10 bill is orange, red, and yellow. Why are the notes being redesigned so soon after the late 1990s changes? You guessed it—to stay one step ahead of the counterfeiter. (The $2 and $1 bills will not be redesigned because they are not as desirable for counterfeiting.) But don't become too fond of the new currency. The government expects to issue newly designed notes every seven to 10 years. Of course, when new notes are issued, the old ones are still accepted in payment for goods and services and only slowly withdrawn from circulation as banks receive them and send them to the Federal Reserve to be replaced with the new notes. Thanks to the efforts of the government, counterfeited notes remain at low levels, estimated to be less than one percent of authentic U.S. currency worldwide.

The Demand for and Supply of Money

Interest Rate
The cost to borrowers of obtaining money and the return (or yield) on money to lenders.

To understand money's role in the financial system, it is helpful to view money as an asset, much as someone might view an apartment house as an asset. The rental costs for apartments and the number of units constructed and rented are determined by two factors: the supply of apartments created by builders and the demand for apartments by renters. The analysis of money proceeds in a similar fashion. The **interest rate** is the cost to borrowers of obtaining money and the return (or yield) on money to lenders. Thus, just as rent is the cost to apartment dwellers and the return to the owner, the interest rate is the rental rate when money is borrowed or loaned, and it is known as the *cost of credit*.[2] By identifying and analyzing the factors affecting the demand for and supply of money, we gain considerable knowledge of both the "rental rate," or interest rate, associated with borrowing or lending money and the quantity of money that is demanded and supplied. As we shall see, changes in interest rates have a profound effect on economic activity.

Quantity Demanded of Money
The specific amount of money that spending units wish to hold at a specific interest rate (price).

The Demand for Money

The **quantity demanded of money** is the specific amount of money that spending units wish to hold at a specific interest rate (price). If we hold other factors constant and allow

only the interest rate to vary, we find there is an inverse relationship between the quantity demanded of money and the interest rate. Holding other factors constant is known as *invoking the ceteris paribus assumption*.[3] Thus, in this case, we conclude, ceteris paribus (a Latin term meaning "all things being equal"), that when the interest rate goes up, the quantity demanded of money goes down, and when the interest rate falls, the quantity demanded of money increases.

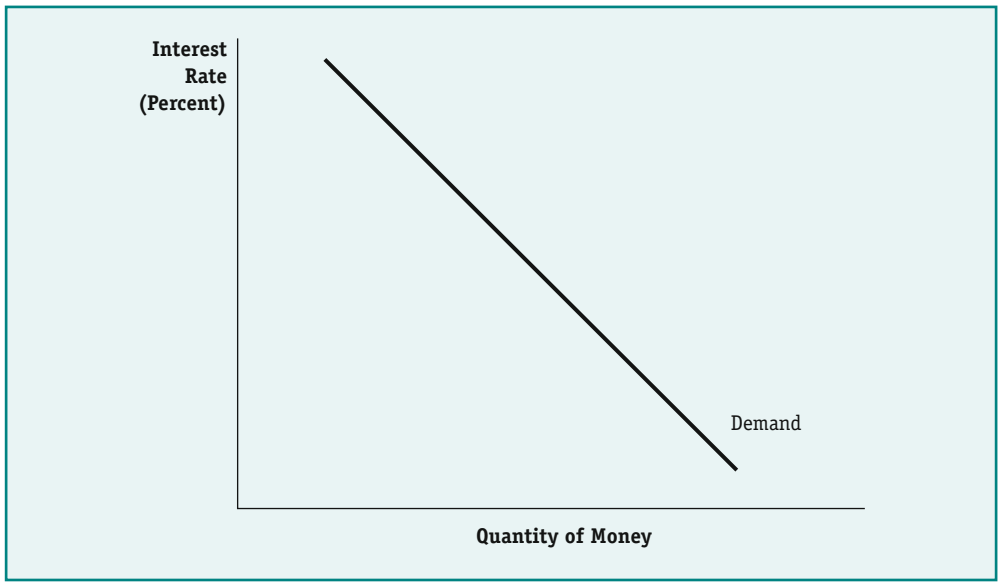
But why is this relationship between the quantity demanded of money and the interest rate inverse? The answer is quite simple if we consider that money (even in interest-earning checking accounts) generally earns less interest than nonmonetary assets (or near monies) such as savings accounts. Consequently, as the interest rate goes up, the opportunity cost of holding money goes up, and ceteris paribus, the quantity demanded of money goes down.[4] People conserve on their holdings of money balances and substitute holdings of other financial assets that pay a higher return. Thus, when the interest rate rises, "portfolio adjustments" decrease the holdings of money whose return has not increased or has increased less than that of nonmonetary assets.

Look at Exhibit 2-5, where we graph various interest rate–quantity demanded combinations to get a downward-sloping demand curve for money.

Demand for Money
The entire set of interest rate–quantity demanded combinations as represented by a downward-sloping demand curve for money.

By the **demand for money,** we mean the entire set of interest rate–quantity demanded combinations—the entire downward-sloping demand curve. The demand for money by spending units is primarily determined by spending plans and by the need to pay for purchases. Spending plans and purchases, in turn, are influenced by income and generally go up when incomes go up. Thus, the demand for money to hold is positively or directly related to income. When our incomes go up, we hold more money for day-to-day transactions. (Melissa goes to the grocery store and takes her kids out for fast food more often after she gets a raise.) In addition to income and spending plans, other factors also affect the demand for money. These other factors include changes in inflation, changes in computer and telecommunications technologies that

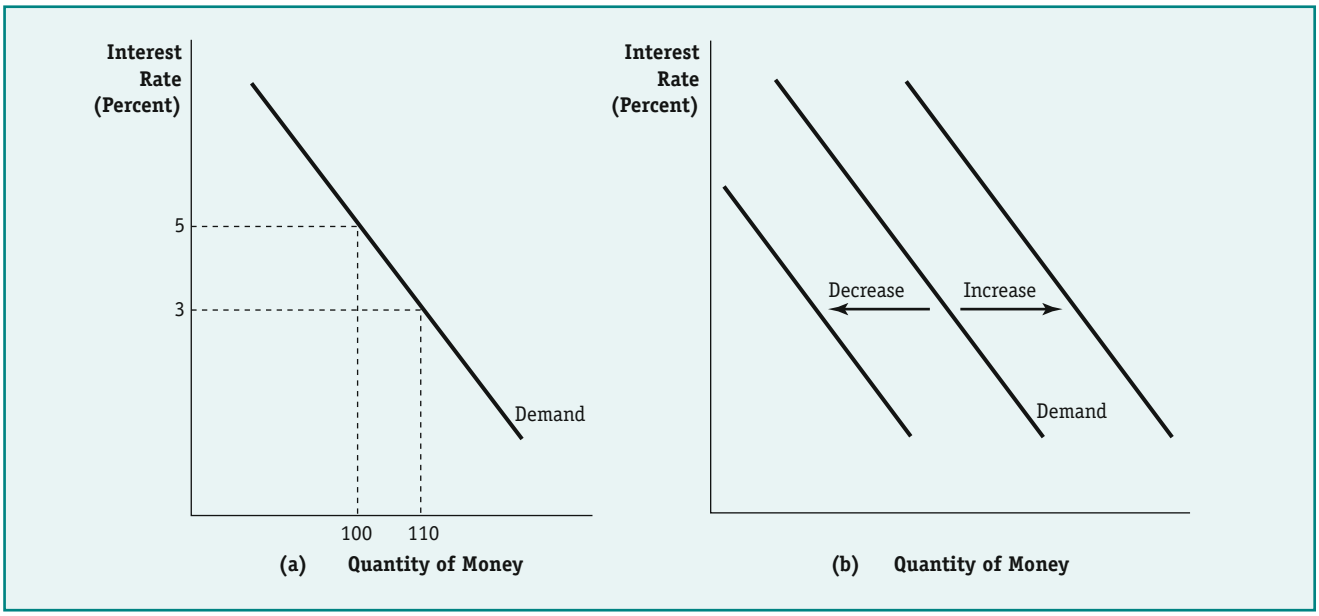
2-5
The Demand for Money



The quantity of money is measured on the horizontal axis, and the interest rate is measured on the vertical axis. Ceteris paribus, the quantity demanded of money is inversely related to the interest rate. As the interest rate falls, quantity demanded increases. As the interest rate rises, quantity demanded decreases.

2-6

Changes in the Quantity Demanded of Money Versus Changes in the Demand for Money



Graph (a) illustrates a change in the quantity demanded of money due to a change in the interest rate. If the interest rate falls from 5 to 3 percent, quantity demanded increases from 100 to 110 and vice versa. Graph (b) illustrates a change in the demand for money. A shift of the money demand curve means that the demand for money has changed. A shift to the right means that the demand for money has increased, and a shift to the left means that the demand for money has decreased. If spending and income increase, the curve shifts rightward and quantity demanded increases for every interest rate. Likewise, if income and spending plans decrease, the curve shifts leftward as demand decreases.

affect how we make payments, and changes in the risk and liquidity of other financial instruments.

In terms of Exhibit 2-5, when the demand for money changes, the entire demand curve shifts. For example, when the demand for money decreases, say, due to a decrease in incomes, the entire demand curve shifts to the left. Thus, we can see that changes in factors other than the interest rate affect the demand for money and cause the downward-sloping demand curve to shift. When the interest rate changes, we move along a single money demand curve, and there is a change in quantity demanded. Be certain you are clear about the difference between a *change in quantity demanded* and a *change in demand*. Exhibit 2-6 highlights the difference between changes in the quantity demanded of money and changes in the demand for money.

Recap The demand for money is the amount that will be demanded at various interest rates. The quantity demanded of money is the amount that will be demanded at a specific interest rate. Among other factors, the demand for money is directly related to income. When income increases, demand increases, and vice versa. Ceteris paribus, the quantity demanded is inversely related to the interest rate. When the interest rate increases, the quantity demanded decreases, and vice versa. A change in demand is represented by a shift of the demand curve, while a change in quantity demanded is a movement along a demand curve due to a change in the interest rate.

The Supply of Money

Supply of Money
The stock of money (M1), which includes currency in the hands of the public plus checkable deposits.

Reserves
Assets that are held as either vault cash or reserve deposit accounts with the Fed.

Required Reserve Ratio
The fraction of deposit liabilities that depository institutions must hold as reserve assets.

The **supply of money** is a little more complicated than the demand for money and warrants a brief discussion. Recall that our narrowest definition of transactions money (M1) includes currency in the hands of the public plus checkable deposits. Financial intermediaries that issue checkable deposits (depository institutions) hold reserve assets equal to a certain fraction of those deposits. The **reserves** against the outstanding deposits may be held either as vault cash or, for safety reasons, as reserve deposit accounts with the Fed. The Fed enters the picture in two places:

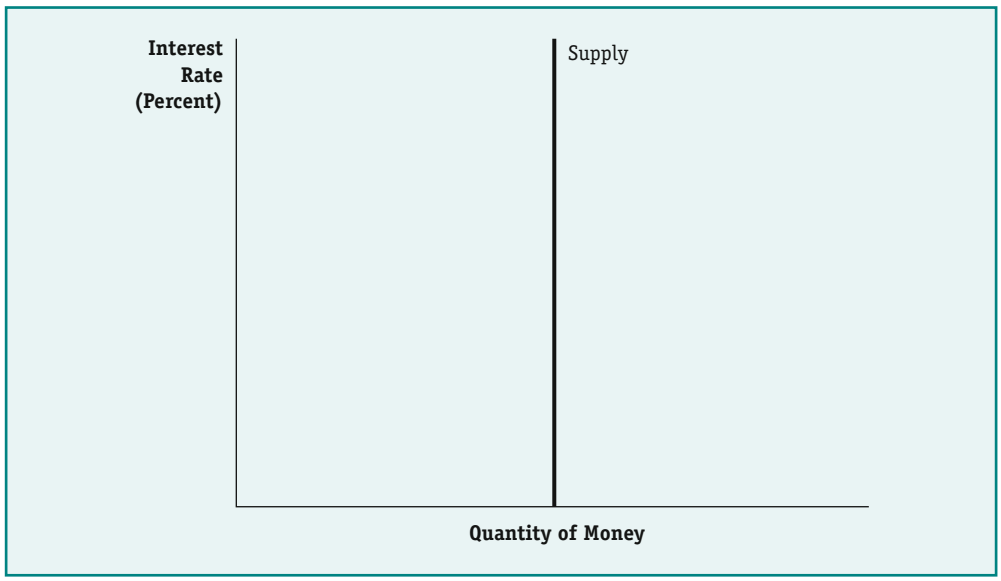
1. A depository institution must have reserve assets equal to a certain percentage of its deposit liabilities. The Fed sets that percentage, which is known as the **required reserve ratio**. For example, if a credit union has checkable deposits in the amount of $1,000 and the Fed has set a 10 percent required reserve ratio, then the credit union must hold $100 in reserves either as cash in its vaults or as deposits with the Fed.
2. As we shall see in later chapters, the Fed influences the amount of cash assets outstanding and hence the amount available for reserves.[5]

Commercial banks (and other depository institutions) enter the picture by influencing the amount of checkable deposits. Banks issue checkable deposits when they receive a deposit into a checking account or when they make a loan. The borrower signs the loan papers, and the intermediary (lender) credits the borrower's checking account with the amount of the loan, creating a checkable deposit or money.

Quantity Supplied of Money
The specific amount of money that will be supplied at a specific interest rate.

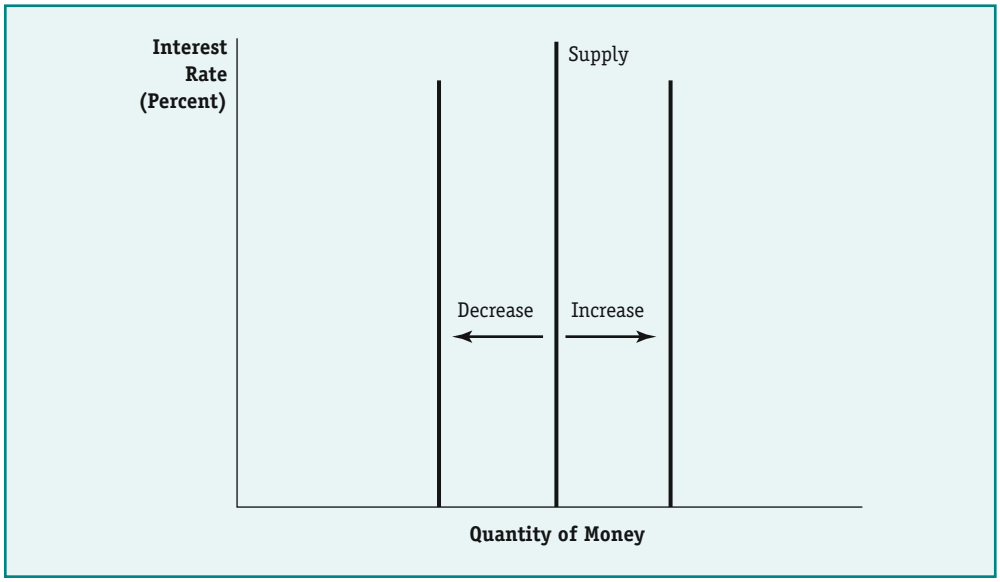
Because the Fed, within some limits, controls the amount of funds available for reserves and sets the required reserve ratio, it exerts significant influence on the maximum amount of checkable deposits that depository institutions can create by making loans; hence, the Fed has significant influence on the money supply. Exhibit 2-7 depicts the relationship between the **quantity supplied of money** and the interest rate as a

2-7
The Supply of Money



The quantity of money is measured on the horizontal axis, and the interest rate is measured on the vertical axis. The supply of money is depicted as a vertical line. The Fed influences the position of the vertical supply curve by determining the amount of cash assets available for reserves and by setting the required reserve ratio.

2-8 Changes in the Supply of Money



An increase in the supply of money is depicted by a rightward shift of the vertical supply curve. If the Fed speeds up the provision of reserves or reduces the required reserve ratio, the supply of money increases. A decrease in the supply of money is depicted by a leftward shift of the vertical supply curve. If the Fed slows down the provision of reserves or increases the required reserve ratio, the supply of money decreases.

vertical line (supply curve).[6] The supply curve is vertical because of the Fed's ability to change the money supply, and, within limits, to control it.

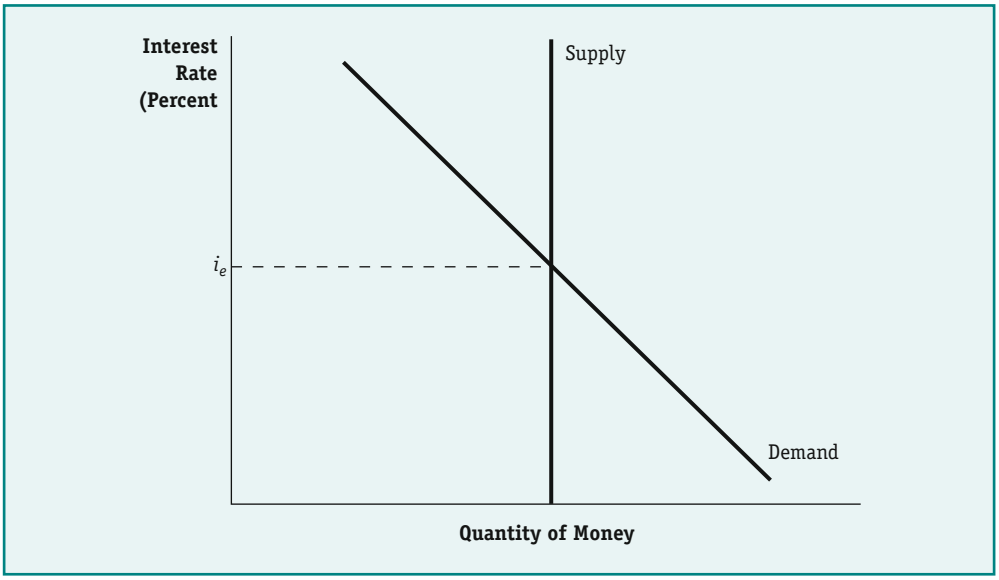
As in the case of demand, the quantity supplied of money is the specific amount that will be supplied at a specific interest rate. By the supply of money, we mean the entire set of interest rate–quantity supplied combinations—the entire vertical supply curve. By changing the quantity of reserves available to the banking system or the required reserve ratio, the Fed can change the supply of money. Changes in the supply of money, initiated by the Fed, are reflected by shifts of the vertical supply curve, as depicted in Exhibit 2-8. If the Fed speeds up the provision of reserves or reduces the required reserve ratio, the money supply curve shifts to the right, and the supply of money increases. Likewise, if the Fed slows down the provision of reserves or increases the required reserve ratio, the money supply curve shifts to the left, and the supply of money decreases.

Recap Depository institutions must hold reserve assets equal to a certain fraction of deposit liabilities—called the *required reserve ratio*—as set by the Fed. The Fed also influences the amount of cash assets outstanding and thus the amount available for reserves. These two factors give the Fed significant influence over the money supply.

Money, Interest Rates, and the Economy

Having previewed the factors that affect demand and supply, we are now in a position to see how the interaction between the supply of and demand for money determines its availability, or quantity, and its cost, or the interest rate. This is shown in Exhibit 2-9.[7] In this example, the market gravitates to i_e, or the equilibrium interest rate, where the quantity supplied of money equals the quantity demanded. If the interest rate is above i_e,

2-9
Market Equilibrium



The market for money is in equilibrium when the quantity demanded is equal to the quantity supplied. This occurs at i_e where the demand and supply curves intersect.

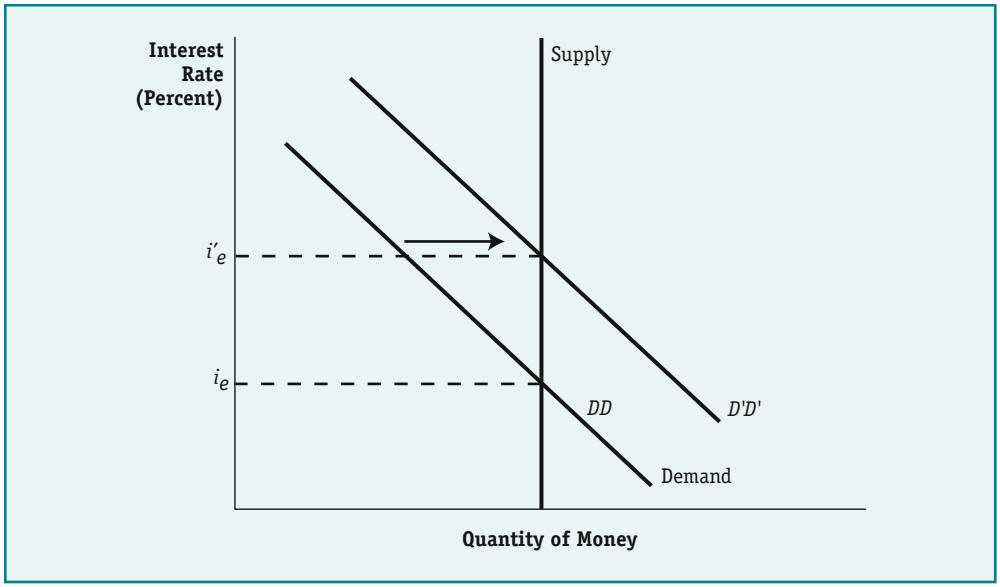
there is an excess quantity supplied of money and, hence, downward pressure on the interest rate. If the rate is below equilibrium, there is an excess quantity demanded of money, and market forces will cause the interest rate to rise. Once the interest rate gravitates to i_e, the market will stay at the equilibrium rate until one of the curves shifts due to a change in either demand or supply.

Changes in the supply of or demand for money will affect the interest rate, just as changes in the supply of or demand for apartments will affect the rent of apartments. Ceteris paribus, if demand increases, the interest rate rises and vice versa. Exhibit 2-10 shows an increase in the demand for money due to increases in income or spending plans. This corresponds to a rightward shift of the demand curve. At the original interest rate, there is excess quantity demanded and upward pressure on the interest rate. The market gravitates to a new equilibrium at the higher interest rate, i'_e.

Likewise, if supply increases, ceteris paribus, the interest rate falls and vice versa. To illustrate, suppose that the Fed, through a stepped-up provision of reserves to depository institutions, succeeds in increasing the supply of money relative to the demand. As Exhibit 2-11 shows, this corresponds to a shift of the supply curve to the right. At the original equilibrium interest rate (i_e), there is excess quantity supplied and, thus, downward pressure on the interest rate. The market gravitates to a new equilibrium at a lower interest rate (i'_e), where quantity demanded is equal to quantity supplied.[8] Note that the analogy continues to hold: we would expect that an increase in the supply of apartments, with no change in demand, would result in a fall in rents and an increase in quantity demanded.

But what is the significance of the changes in interest rates caused by changes in the demand for or supply of money? Simply put, changes in the interest rate affect the aggregate (total) demand for goods and services. Because the Fed's influence comes from the supply side, we consider that case. If the supply of money increases due to the stepped-up provision of reserve assets by the Fed or a reduction in the required reserve ratio, the interest rate falls. The fall in interest rates reduces the cost of borrowing and would prob-

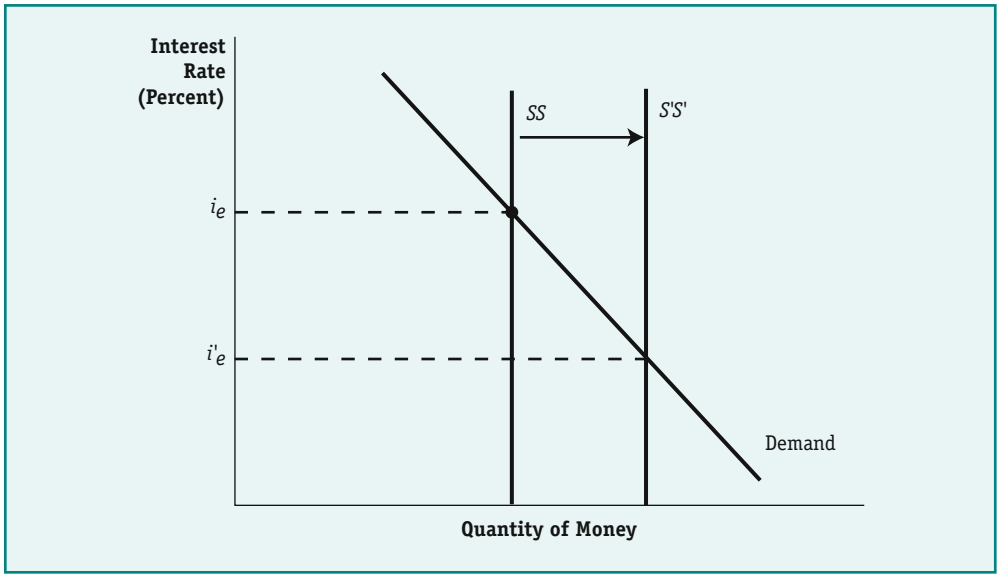
2-10
An Increase in the Demand for Money



An increase in the demand for money leads to an increase in the interest rate from i_e to i'_e.

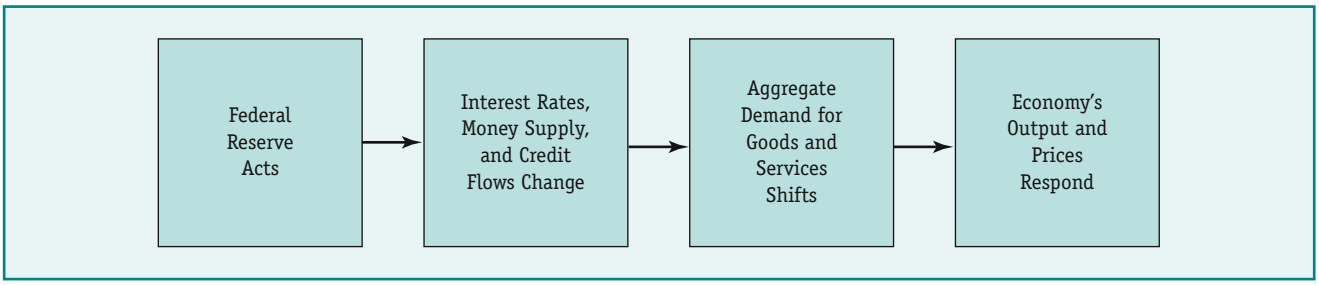
ably encourage some spending units in the economy to borrow more money and use it to purchase more goods and services. Credit would increase, and, more specifically, the increase in the supply of money would lead to an increase in the aggregate demand for goods and services. The increased demand for goods and services might lead to both an increase in the quantity of goods and services produced (supplied) and an increase in the general level of prices in the future, as the level of economic activity increases. The opposite would happen if the Fed took action to raise interest rates by reducing the supply

2-11
An Increase in the Supply of Money



When the supply of money increases from SS to S'S', the equilibrium interest rate falls from i_e to i'_e.

2-12
How Money Matters: An Illustration



If the Fed wants to encourage an increase in economic activity, it will engage in actions that increase the money supply and credit flows and decrease interest rates. These changes will, in turn, tend to raise the aggregate demand for goods and services by households and firms. The response by producers (suppliers) of goods and services to the higher demand will probably include expansion of output and an increase in prices.

of money. Thus, by orchestrating changes in the interest rate via changes in the money supply, the Fed can speed up or slow down the level of economic activity. Exhibit 2-12 shows how the general relationships discussed in this section are important for the economy as a whole. Remember, this is just a first approximation that does not include many details; we do not expect you to understand all the specifics yet!

Recap The interest rate is determined by the supply of and demand for money. Equilibrium occurs at the interest rate where the quantity demanded of money is equal to the quantity supplied. Changes in the supply of or demand for money (shifts of the supply or demand curves) affect the interest rate. Ceteris paribus, if demand increases, the interest rate rises and vice versa. Ceteris paribus, if supply increases, the interest rate falls and vice versa. Changes in interest rates affect the demand for goods and services in the economy and hence the level of economic activity.

Summary of Major Points

1. Money is anything that functions as a medium of exchange, a unit of account, and a store of value. The high transactions cost of barter encourages the development of money. The existence of money encourages specialization and trade, both of which foster economic growth and development.
2. The Fed monitors and publishes data on the monetary aggregates M1 and M2, and a broad credit aggregate, DNFD. M1 (currency plus checkable deposits) is the best measure of the money supply currently available for transactions purposes. M2 is everything in M1 plus some other highly liquid assets (near monies). DNFD includes all domestic public and private debt excluding debt of financial institutions that borrow for the purpose of relending. In recent years, the behavior of the aggregates has become a less reliable barometer of economic activity because of the less stable relationships between the aggregates and economic activity.

3. The payments mechanism is the means used to transfer money among transactors. Checks, for example, transfer ownership of checkable deposits. Innovations now being adopted suggest that an increasingly larger percentage of payments is being made with electronic funds transfer systems. Such innovations include debit cards, stored-value cards, smart cards, point-of-sale terminals, and ATMs. Smart value cards have microprocessor chips that allow anonymous, secure payments to be made.
4. The interest rate is the cost to borrowers of obtaining money and the return (or yield) on money to lenders. It is the cost of credit. Ceteris paribus, the quantity demanded of money and the interest rate are inversely related.
5. The demand for money is determined by the spending plans of spending units, which are usually positively or directly related to income. The supply of money is strongly influenced by the Fed through its control over cash assets available for reserves and the required reserve ratio.
6. The interaction between the supply of and the demand for money determines the equilibrium quantity of money and the equilibrium interest rate. In general, the initial effect of either an increase in the money supply or a decrease in money demand will be a fall in the interest rate, ceteris paribus. Conversely, the initial effect of either a decrease in the money supply or an increase in money demand will be a rise in the interest rate, ceteris paribus.
7. Changes in the money supply, credit, and the interest rate will generally alter the aggregate (total) demand for goods and services in the economy. Changes in aggregate demand will, in turn, affect the overall level of output and prices. More specifically, a rise in the money supply and/or credit flows and the accompanying fall in the interest rate will generally raise aggregate demand and lead to an expansion of output and some rise in prices. By orchestrating changes in interest rates via changes in the money supply, the Fed can speed up or slow down the level of economic activity.

Key Terms

Automated Teller Machine (ATM), p. **31**
Barter, p. **24**
Checkable Deposits, p. **27**
Demand Deposits, p. **27**
Demand for Money, p. **34**
Domestic Nonfinancial Debt (DNFD), p. **28**
Double Coincidence of Wants, p. **24**
Electronic Funds Transfer System, p. **30**
Interest Rate, p. **33**
Means of Payment (Medium of Exchange), p. **24**
Monetary Aggregates, p. **27**
Money, p. **24**
Money Market Deposit Accounts (MMDAs), p. **27**
M1, p. **27**
M2, p. **27**
Near Monies, p. **28**
Payments Mechanism, p. **30**
Point-of-Sale Terminal, p. **30**
Quantity Demanded of Money, p. **33**
Quantity Supplied of Money, p. **36**
Required Reserve Ratio, p. **36**
Reserves, p. **36**
Smart Cards, p. **31**
Store of Value, p. **26**
Stored-Value Cards, p. **30**
Supply of Money, p. **36**
Unit of Account, p. **26**

Review Questions

1. Discuss or define briefly the following terms and concepts: *means of payment*, *store of value*, *unit of account*, *barter*, *monetary aggregates*, *liquidity*, *nonfinancial debt*, *electronic funds transfer system*, and *risk*.
2. What are the functions of money? Which function do you think is most important?
3. Suppose we define *money* as that which serves as a store of value. Explain why this is a poor definition.
4. How does the Fed calculate M1, M2, and DNFD? Are these aggregates all money? Why or why not? Which contains the most liquid assets? Which is smallest? Which is largest? Which

monetary aggregate is most closely associated with transactions balances?

5. Why is the debt of financial institutions excluded from DNFD?
6. What is the payments mechanism? What changes are occurring in this mechanism? Why are they occurring? How do smart cards differ from stored-value cards?
7. Zoto is a remote island that has experienced rapid development. In contrast, Zaha is an island where growth has been sluggish and the level of economic activity remains low. How could the existence of money have affected these two outcomes?
8. Your friend took a class in money and banking two years ago and recalls that currency in the hands of the public is in M1. Explain to your friend why currency in the hands of the public is also included in M2.
9. Briefly define *the interest rate*, *reserves*, and *the required reserve ratio*.
10. Discuss the similarities between how the price of cell phones is determined in the market for cell phones and how the interest rate is determined in the market for money.
11. What is the difference between the demand for money and the quantity demanded of money?
12. What is the opportunity cost of holding money?
13. Chris and Harold Yoshida are a young couple with a growing income. What will happen to their demand for money over time?
14. In what form can a depository institution hold reserves? Who determines the amount of funds available for reserves? How does the Fed influence the amount of reserves a depository institution must hold?

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

✓15. In which monetary aggregate(s) is each of the following assets included?

a. Small savings and time deposits ($100,000)
b. Money market deposit accounts
c. Currency in the hands of the public
d. Checkable deposits
e. Individual money market mutual funds
f. Institutional money market mutual funds
g. Large time deposits
h. Travelers' checks

16. Show on a graph how the interest rate and the quantity demanded of money are related. Do the same for the quantity supplied of money. When is the market for money in equilibrium?

✓17. Assume the market for money is originally in equilibrium. Explain what happens to demand, supply, quantity demanded, and/or quantity supplied, ceteris paribus, given each of the following events:

a. The Fed lowers reserve requirements.
b. Households increase their spending plans.
c. Income falls due to a severe recession.
d. The Fed steps up its provision of reserves to depository institutions.

✓18. Graph each case presented in question 17.

✓19. Ceteris paribus, what happens to the demand for money if incomes go down? Ceteris paribus, what happens to the supply of money if reserves go up? In each case, does the interest rate change? Graph each case.

✓20. Use a graph to show what happens to the interest rate if the demand for money is increasing while the supply of money is decreasing.

Suggested Readings

For an interesting discussion of many of the topics in this chapter, see the most recent Fed chair's "Monetary Policy Report to Congress" that is given in February and July of each year. The report and testimony of the chair is available on the Internet at **http://www.federalreserve.gov/.**

A beautiful book well worth the effort to locate is *Money: A History*, ed. Jonathan Williams (New York: St. Martin's Press, 1997).

For an extremely comprehensive look at money, see *A History of Money from Ancient Times to the Present Day*, 3rd. ed., Glyn Davies (Cardiff: University of Wales Press, reprinted 2005).

For an inclusive look at many of the topics discussed in this chapter, including the face of U.S. currency, counterfeiting, new currency designs, and the history of money, go to **http://www.minneapolisfed.org/econed/curric/money.cfm.**

An interesting discussion that deals with many topics about our nation's coins and currency is found in the testimony of Louise L. Roseman, director, Division of Reserve Bank Operations and Payment Systems, before a subcommittee of the U.S. House of Representatives, July 19, 2006. Roseman's testimony, the text of which is available on the Internet at **http://www.federalreserve.gov/boarddocs/testimony/2006/,** includes a discussion of the introduction of the new currency, a new dollar coin to be minted in 2007, and anticounterfeiting measures. Two useful Internet brochures can be accessed from the home page of the Atlanta Federal Reserve Bank at **http://www.frbatlanta.org/.** They are "Dollars and Cents: Fundamental Facts about U.S. Money" and "Paying for It: Checks, Cash, and Electronic Payments."

Another interesting site is **http://www.moneyfactory.com/.** For specific information on the newly redesigned currency, see **http://www.moneyfactory.com/newmoney/.**

For current statistical data on the monetary aggregates, see **http://www.federalreserve.gov/releases/H6/.**

For a more academic discussion of money, see Paul Dalziel, "On the Evolution of Money and Its Implications for Price Stability," *Journal of Economic Surveys* 14:4 (September 2000): 373–93.

For an interesting article on the development of barter, metal coins, and paper money, see Robert Ferris, "Money: A Pictorial History," *Business Credit* 98 (June 1996): 20–31.

Endnotes

1. M1 also includes travelers' checks, which account for a relatively small portion. For simplicity's sake, we ignore travelers' checks.
2. The market in which money is borrowed and loaned is called the *credit market*. In Chapter 6, we look in depth at interest rate determination from the perspective of the credit market, where the interest rate is determined by the supply of and demand for loanable funds.
3. In economics, we make the ceteris paribus assumption so that we can investigate the relationship between two variables without having changes in additional variables conceal that relationship.
4. The *opportunity cost* is the value of the next best alternative that is forgone.
5. Cash outside the Fed is either held by the public or deposited in a financial intermediary. If it is deposited, it serves as reserves for the financial intermediaries that issue checkable deposits, and it is considered a cash asset.
6. Some economists consider the money supply curve to be upward sloping instead of a vertical line. The reasoning is that when interest rates rise, depository institutions find innovative ways around reserve requirements in order to make more loans. The loans are more profitable because they are made at higher interest rates. In the process of making additional loans, more money is created.
7. As is commonly known, there are many interest rates in the economy, so speaking of "the interest rate" as if there were only one is an obvious simplification. Once the fundamentals have been developed, it will be much easier to extend our analysis to take into account the many different interest rates.
8. The ceteris paribus condition is very important here. For example, if the Fed takes actions that lead to increases in the money supply, then inflationary expectations may also increase. If inflationary expectations change, then the ceteris paribus condition is violated. In this case, increases in the money supply may lead to increases in interest rates because of the effect on inflationary expectations. Lenders will have to be compensated with higher interest to make up for the loss in the purchasing power of the money they have lent, a loss caused by inflation.

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CHAPTER THREE

3

The worst form of inequality is to try to make unequal things equal.

—Aristotle

Financial Markets, Instruments, and Market Makers

Learning Objectives

After reading this chapter, you should know:

The various ways of classifying financial markets, including primary and secondary markets; money and capital markets, and spot and futures markets

The definitions and characteristics of the major financial market instruments

The functions of the key participants—the market makers

How the various sectors of financial markets are connected

GAME TALK

To understand the role of financial markets and instruments in the financial system, we need to understand the jargon employed by insiders, or market participants, when they describe and discuss the "action" in financial markets. Trade jargon is not unique to these insiders, but it is pervasive in many aspects of life, including football. As the following example shows, even in this favorite American pastime, the "players" need to understand the lingo.

The time is Saturday afternoon during fall, and the place is the gridiron. When the quarterback reads a blitz (or red-dog) and man-to-man coverage, it is critical for him to call an automatic at the line of scrimmage and hit the flanker on a fly pattern. Of course, if the blitz does not materialize, the quarterback may find that he has thrown the pass into the teeth of zone coverage where the free safety can easily pick off the ball.

Such is the jargon of football. Much of this lingo is fully understood only by insiders—players, coaches, and football aficionados. Outsiders have difficulty understanding the game because they don't know the jargon, just as outsiders often have difficulty understanding financial market discussions. In this chapter, we will learn about financial markets and instruments (chiefly in the United States) and the language their participants use so that we too can understand what they are talking about.

INTRODUCING FINANCIAL MARKETS

A market for financial claims (instruments) can be viewed as the process or mechanism that connects the buyers and sellers of claims regardless of where they happen to be physically located.[1] Financial markets can be classified in many different ways. One of the most popular classifications divides the financial markets into individual submarkets according to the type of financial instrument that is traded: stock market, corporate bond market, Treasury bill market, commercial paper market, and so forth. There is, however, at least one difficulty with this classification scheme; it suggests that the individual submarkets are separate, more or less unconnected, compartments. A central message of this chapter is that the markets for the individual financial claims are connected and in many respects alike.

Money Market
The market for financial assets with an original maturity of less than one year.

Capital Market
The market for financial assets with an original maturity of greater than one year.

Term to Maturity
The length of time from when a financial security is initially issued until it matures.

Primary Market
The market in which a security is initially sold for the first time.

Another classification system assigns the various financial markets to either the **money market** or the **capital market** based on the length of the term of the instruments traded there. The money market includes those markets where securities with original maturities of one year or less are traded. Examples of such securities include Treasury bills, commercial paper, and negotiable certificates of deposit (CDs). The capital market includes those markets where securities with original maturities of more than one year are traded. Examples here include corporate bonds, stocks, mortgages, and U.S. Treasury notes and bonds. Not surprisingly, some refer to the money market as the *short-term market* and the capital market as the *long-term market*.

Notice that, together, the money market and the capital market include all of the individual submarkets we identified in the first classification scheme. In this case, however, we are grouping instruments by their **term to maturity,** which is the length of time from when the instrument is initially issued until it matures.

A third way to classify financial markets is to categorize them as the primary market and the secondary market. The **primary market** is the market in which a security is initially sold for the first time. For example, if a firm needs to issue new bonds or stocks to finance investment in new equipment, the initial sale of these new securities occurs in

the primary market. Thus, the primary market is where the public (individuals or financial institutions) buys newly issued bonds or stocks from the firms issuing them. Once a firm has issued bonds or stocks, further trading—say, a sale of bonds a month later by an initial purchaser—occurs in the **secondary market.**

Secondary Market
The market in which previously issued financial securities are sold.

In practice, the selling of new securities in primary markets by the firms issuing them and the trading of older securities in secondary markets occur simultaneously. However, this does not negate the importance of secondary markets and, particularly, high-quality secondary markets. We assess the quality of a secondary market by the cost and inconvenience associated with trading existing securities. In high-quality secondary markets, securities are traded at relatively low cost and little inconvenience. Such characteristics facilitate the sale and purchase of existing securities and thereby contribute to an efficient allocation of financial resources and a smoothly functioning savings-investment process.

To illustrate the point, imagine a financial system like those in many less-developed countries, where formal secondary markets do not exist. Assume now that you want to sell a security you purchased several years ago when it was first issued, say, by LHT, Inc., an emerging high-tech firm. The absence of a secondary market means that you would first have to search for someone willing and able to purchase your LHT security and then negotiate a mutually acceptable price with that person. This process would obviously be quite time consuming and inconvenient, and the experience might discourage you from saving part of your income in this way in the future; that is, you would be less likely to buy LHT bonds in the future. If other people who own securities have similar experiences, LHT, Inc., and all firms like it will encounter some difficulty in financing future deficits, and the amount of borrowing and lending will be less than it otherwise would have been. Assuming that the deficits were to be used for planned additions to the firms' plant and equipment, the amount of investment will fall. Without this investment, there will be less future growth of output and employment in the industry and the economy.

The message in this example is that the lack of a smoothly functioning secondary market will inhibit the financing of planned deficits in the primary market and thus have an adverse effect on investment and economic growth over time. In general, the strength and viability of primary markets are direct functions of the quality of secondary markets. Although the secondary market does not generate additional funds for the economy as a whole, its importance stems from the positive effect that a well-developed secondary market has on the primary market.

Another way to classify financial markets is by whether the transactions they arrange occur instantly or in the future according to terms decided today; that is, by whether the markets are spot or futures and forward markets. In **spot markets,** financial instruments trade instantaneously, and the spot price is the price of a security or financial instrument for immediate delivery. We are all familiar with spot markets. For example, if I decide to buy a share of IBM stock, I check with my broker and find out today's price for the stock. Or I use my computer to check stock and bond prices online.

Spot Markets
Markets in which the trading of financial securities takes place instantaneously.

Financial Futures Markets
Organized markets that trade financial futures agreements.

Financial Forward Markets
Markets that trade financial forward agreements usually arranged by banks or other brokers and dealers.

At other times, I may be interested in buying or selling financial instruments for delivery on some date in the future at a price determined today. In this case, I enter the **financial futures** or the **financial forward markets,** where transactions are consummated today for the purchase or sale of financial instruments on a date in the future. Financial futures agreements trade U.S. government securities of several maturities, several stock market indexes, and foreign currencies on future specific dates. All quantities and futures dates are standardized. Financial forward agreements are transactions that are consummated today for the purchase or sale of financial

instruments on a date in the future where the quantities and delivery dates are not standardized. Banks and other dealers and brokers customize financial forward agreements for their customers. Financial futures and forward markets are also called **derivative markets** because the value of the financial instruments (the futures and forward agreements) "derive" their values from the underlying instruments such as the government security, the shares of stock, and so on that are traded on the future date. In recent years, other complex types of derivative instruments besides futures and forward agreements have been created and are becoming part of the burgeoning derivative markets.

Derivative Markets
Financial futures markets where the value of the financial instruments (the futures and forward agreements) "derive" their values from the underlying instruments such as the government securities, the shares of stock, etc., that are traded on the future date; financial futures and forward markets, among others, are examples of derivative markets.

Financial futures and forward markets fulfill two basic functions. First, futures and forward markets may be used to reduce the risk associated with future price changes by "locking in" a future or forward price today. In recent years, financial futures and forward markets have experienced enormous growth. As financial prices have become more volatile, net lenders and net borrowers have turned to financial futures and forward markets to deal with the greater risk of unanticipated price changes. Second, financial futures and forward markets can also be used to speculate. **Speculation** in financial securities is the buying or selling of securities in the hope of profiting from future price changes. The many intricacies and nuances of financial futures and forward (derivative) markets are covered in detail in Chapter 23.

Speculation
The buying or selling of financial securities in the hopes of profiting from future price changes.

Recap Financial markets can be classified as money or capital markets, as primary or secondary markets, or as spot or futures and forward markets. Money markets trade financial instruments with an original maturity of one year or less. Capital markets trade financial instruments with an original maturity of more than one year. Primary markets trade newly issued financial instruments, and secondary markets trade previously issued financial instruments. In spot markets, the trading of financial instruments takes place instantaneously. In financial futures and forward markets, the terms of the trade including price are arranged today, but the transaction occurs at some date in the future.

MAJOR FINANCIAL MARKET INSTRUMENTS

Financial markets perform the important role of channeling funds from net lenders to net borrowers. Because the action in financial markets involves the trading of financial instruments, understanding the action requires us to be familiar with what is being traded. We first examine the securities traded in the money market and then look at those traded in the capital market.

Money Market Instruments

Although individuals can invest in many money market instruments, the money market is primarily a wholesale market where large institutions trade low risk, highly liquid short-term financial claims issued in denominations of $1 million or more.[2] The money market brings together borrowers such as financial and nonfinancial firms that have short-term borrowing needs with those lenders, including other financial and nonfinancial firms, that have short-term funds to lend. The money market has undergone significant changes in the past 40 years, with new financial instruments being introduced and the amount outstanding of other instruments increasing at a far more rapid pace than the level of economic activity. In Chapter 11, we discuss the money market in detail. For now, we introduce and briefly describe each of the principal money market

Money and Other Financial Claims

In Chapter 1, we saw that net lenders usually lend their surplus funds to net borrowers through the financial system (financial markets and financial intermediaries). Put another way, purchasing power is transferred from those who have it to those who need it. What is transferred, in fact, is current purchasing power, which is exchanged for another financial asset, or a future claim on money. In effect, net lenders "rent out" their surplus funds to net borrowers for a given period of time, much as a landlord rents out an apartment. In financial markets, the net lender acquires a financial asset, which is a claim on and liability of the borrower. The claim, an asset to the holder and a liability to the issuer, is really an IOU—a promise by the borrower to repay the original amount borrowed (the principal) plus "rent" (the interest) to the lender.

Financial claims, other than money, are issued by borrowers or financial intermediaries. The intermediaries issue claims on themselves and then, in turn, lend to borrowers. The financial system includes many different types of financial claims, reflecting the wide variety of borrowers and lenders and the tendency to tailor particular types of claims to the preferences and needs of the net lenders and net borrowers. Since the 1990s, the trend among net lenders has been to bypass depository institutions and to put a large share of their surplus funds into mutual funds, the most rapidly growing type of intermediary.[1]

Because all financial claims, whether they be bank deposits, stocks, or Treasury bills, are claims on money, they can in some sense be compared with one another as well as with money. Traditional standards of comparison include the risk and the liquidity of various claims.

Risk refers to the possibility or probability that the value of a claim will decline. One example of risk is the possibility that a borrower will default and fail to pay back all or part of the principal or the interest. This risk is similar to the risk that a renter will burn down the apartment building or fail to pay his rent and be difficult to evict. The higher the probability of receiving less money back than expected, the riskier the financial claim is relative to money.

The *liquidity* of a financial claim (or asset) is determined by how easy or difficult it is to convert the asset into money. The ease (or difficulty) is defined in terms of the cost and time associated with the conversion. If significant costs or considerable time is required to convert a particular type of asset to money, it is usually referred to as *illiquid*. As the costs and time required to exchange a particular asset approach zero, the liquidity increases, with money representing perfect liquidity.[2]

Endnotes

1. Mutual funds are investment pools in which a large number of shareholders purchase securities such as stocks and bonds.
2. During the middle of the nineteenth century, coal miners' wages in Staffordshire, England, were paid partly in beer! Commenting on this practice, Charles Fay, a historian, remarked: "This currency was very popular and highly liquid, but it was issued to excess and difficult to store" (*Life and Labour in the Nineteenth Century* (Cambridge: Cambridge University Press, 1920): 197.

3-1
The Principal Money Market Instruments: Amount Outstanding, End of Year (in billions of dollars)

Type of Instrument	1960	1970	1980	1990	2000	2008[a]
Treasury bills	$37	$76	$200	$482.0	$647.0	$1,489[a]
Negotiable CDs	0	45	260	546.9	1,052.6[b]	2,384.9[ab]
Commercial paper[c]	5	35	99	558.0	1,602.0	1,555.3[ac]
Bankers' acceptances	1	4	32	52.0	9.0	0.0
Repurchase agreements and fed funds	1	22	102	324.0	1,197.0	2,118.1
Eurodollars	0.8	2.4	61.4	103.5	191.1	NA[d]

a. As of September 30, 2008.
b. Includes all large time deposits greater than $100,000.
c. Includes commercial paper issued by financial and nonfinancial firms.
d. Not available.
Sources: *Federal Reserve Flow of Funds Accounts, Z.1* (December 11, 2008), at **http://www.federalreserve.gov/releases/Z1/**; the U.S. Treasury at **http://www.fms.treas.gov/bulletin/b2006-3.pdf.**

instruments. Exhibit 3-1 shows the dollar amount of the principal instruments outstanding at the end of 1960, 1970, 1980, 1990, 2000, and 2007. Exhibit 3-2 summarizes the typical maturities, major borrowers, and degree of secondary market activity for these instruments.

U.S. Treasury Bills (T-bills)
Short-term debt instruments of the U.S. government with typical maturities of three to 12 months.

U.S. Treasury Bills

U.S. Treasury bills (T-bills) are short-term debt instruments of the U.S. government with maturities of four weeks, 13 weeks, 26 weeks, and 52 weeks. Although the

3-2
The Money Market

Instrument	Typical Maturities	Principal Borrowers	Secondary Market
Treasury bills	3 to 12 months	U.S. government	Very active
Negotiable CDs	1 to 6 months	Depository institutions	Modest activity
Commercial paper	1 to 270 days	Financial and business firms	Moderately active
Bankers' acceptances	90 days	Financial and business firms	Limited
Repurchase agreements	1 day, and 2 days to 3 months typical; 6 months less typical	Banks, securities dealers, other owners of securities, nonfinancial firms, governments	None, but very active primary market for short maturities
Fed funds	Chiefly 1 business day	Depository institutions	Active brokers' market
Eurodollars	Overnight, 1 week, 1 to 6 months, and longer	Banks	None

minimum denomination is $1,000 and T-bills are sold in $1,000 increments, for institutional buyers the minimum amount is usually several million dollars. T-bills pay a set amount at maturity, have no explicit interest payments, and are sold in regularly scheduled auctions.[3] In reality, they pay interest by initially selling at a discount—that is, at a price lower than the amount paid at maturity. For instance, in April 2009, you might pay $9,770 to buy a one-year (52 week) Treasury bill that can be redeemed for $10,000 in April 2008; thus, the bill effectively pays $230 in interest ($10,000 – $9,770 = $230). The yield on such a bill is 2.35 percent or $230/$9,770 [(interest amount)/(purchase price)].

U.S. Treasury bills are the most liquid of all the money market instruments because they have an active secondary market and relatively short terms to maturity. They also are the safest of all money market instruments because there is no possibility that the government will fail to pay back the amount owed when the security matures. The federal government is always able to meet its financial commitments because of its ability to increase taxes or to issue currency in fulfillment of its scheduled payments.

Negotiable Certificates of Deposit (CDs)

A certificate of deposit (CD) is a short-term debt instrument sold by a depository institution that pays annual interest payments equal to a fixed percentage of the original purchase price. In addition, at maturity the original purchase price is also paid back. Prior to 1961, most CDs were not negotiable; that is, they could not be sold to someone else and could not be redeemed from the bank before maturity without paying a significant penalty. In 1961, with the goal of making CDs more liquid and more attractive to investors, Citibank introduced the first **negotiable certificates of deposit (CDs).** Such negotiable CDs could be resold in a secondary market, which Citibank created. Negotiable CDs have a maturity of one week to 12 months and have a minimum denomination of $100,000. In practice, the minimum denomination to trade in the secondary market is over $1,000,000. Most large commercial banks and many large savings and loans now issue negotiable CDs. In addition, smaller banks are able to borrow in the market by using brokers to sell their CDs.

Negotiable Certificates of Deposit (CDs)
Certificates of deposit with a minimum denomination of $100,000 that can be traded in a secondary market, most with an original maturity of one to 12 months.

Commercial Paper

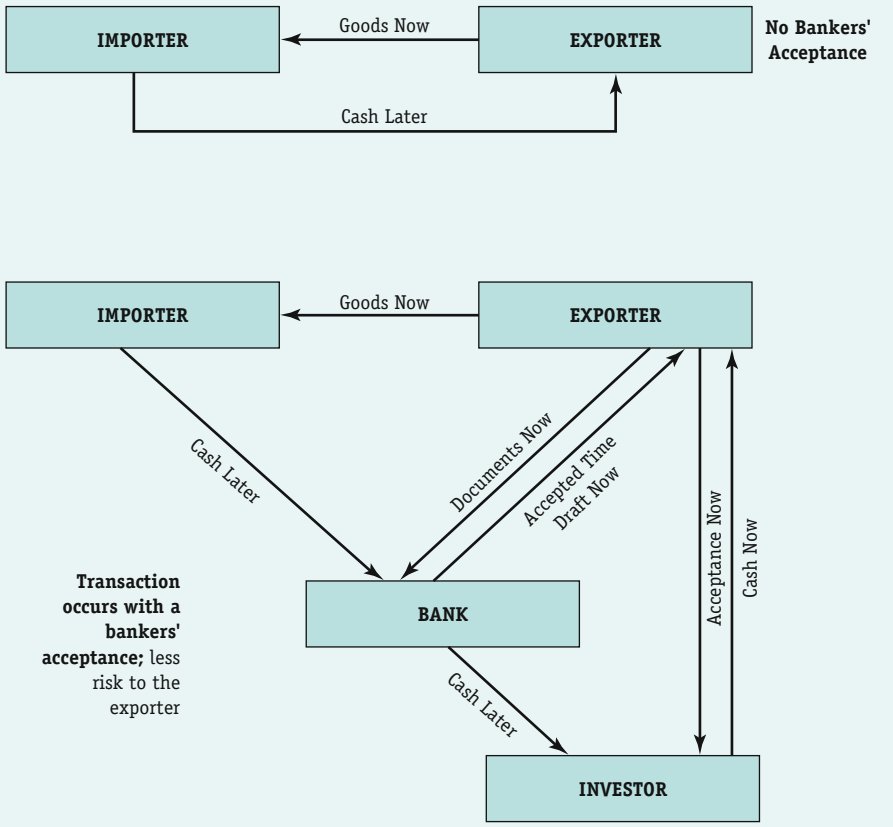
Commercial paper, a short-term debt instrument issued by financial and nonfinancial corporations, has an original maturity of less than 270 days. Most commercial paper is issued with 30 to 60 day maturities and is supported by a backup line of bank credit. Prior to the 1960s, corporations usually borrowed short-term funds from banks to finance such things as inventories and day-to-day expenses. Since then, many corporations have come to depend on selling commercial paper to other financial intermediaries and other lenders for their immediate short-term borrowing needs. The growth of the commercial paper market since 1960 has been impressive and is partially due to the increase in commercial paper issued by nonfinancial firms. Initially, only large well-known corporations had access to the commercial paper market. In the late 1980s and early 1990s, medium and small firms found ways to enter this market by getting letters of credit from a bank that, for a fee, guaranteed payment in the event of default by the issuer. In addition, some financial intermediaries also get funds to invest and lend by issuing commercial paper.

Commercial Paper
Short-term debt instruments issued by corporations.

Bankers' Acceptances

Bankers' acceptances are money market instruments created in the course of financing international trade where the credit worthiness of one trader is unknown to the

Bankers' Acceptances
Money market instruments created in the course of international trade to guarantee bank drafts due on a future date.



Source: Adapted from Ann-Marie Meulendyke, *U.S. Monetary Policy and Financial Markets* (New York: Federal Reserve Bank of New York, 1989): 80.

other. Typical maturities are from 30 to 180 days. Banks were first authorized to issue bankers' acceptances to finance the international and domestic trade of their customers by the Federal Reserve Act in 1913. Exhibit 3-3 depicts how bankers' acceptances work. A bankers' acceptance is a bank draft (a guarantee of payment similar to a check) issued by a firm and payable on some future date. For a fee, the bank on which the draft is drawn stamps it as "accepted," thereby guaranteeing that the draft will be paid. If the issuing firm fails to deposit the funds into its account to cover the draft by the future due date, the bank is obligated to pay the draft, making the draft more likely to be accepted when it is used to purchase goods abroad. The party that accepts the draft (often another bank) can then resell the draft in a secondary market at a discount before the due date, or it can hold the draft in its portfolio as an investment. Bankers' acceptances that trade in secondary markets are similar to Treasury bills in that they sell at a discount. The amount of bankers' acceptances outstanding increased by nearly 4,000 percent ($2 billion to $75 billion) between 1960 and 1984. Since 1984, however, the acceptance market has declined due to the growth of other financing alternatives and the increased

trade in currencies other than the dollar. By March 2008, the amount of outstanding bankers' acceptances had fallen to $0.2 billion.

Repurchase Agreements

Repurchase Agreements
Short-term agreements in which the seller sells a government security to a buyer and simultaneously agrees to buy it back on a later date at a higher price.

Repurchase agreements are short-term agreements in which the seller sells a government security to a buyer and simultaneously agrees to buy the government security back on a later date at a higher price. In effect, the seller has borrowed funds for a short term, and the buyer ostensibly has made a secured loan for which the government security serves as collateral. If the seller (borrower) fails to pay back the loan, the buyer (lender) keeps the government security. For example, assume that a large corporation, such as IBM, finds it has excess funds in its checking account that it doesn't want sitting idly when they can earn interest. IBM uses these excess funds to buy a repurchase agreement from a bank. In the agreement, the bank sells government securities while agreeing to repurchase the government securities the next morning (or in a few days) at a higher price than the original selling price. The difference between the original selling price and the higher price for which the securities are bought back is, in reality, interest. The effect of this agreement is that IBM has made a secured loan to a bank and holds the government securities as collateral until the bank repurchases them when it pays off the loan. Repurchase agreements were created in 1969. Most repurchase agreements are overnight, although some are longer term. Almost all have a minimum denomination of $1 million. Outstanding repurchase agreements are now an important source of funds to banks.

Federal (Fed) Funds

Federal (Fed) Funds
Loans of reserves (deposits at the Fed) between depository institutions, typically overnight.

Federal (Fed) funds are typically overnight loans between depository institutions of their deposits at the Fed. This is effectively the market for excess reserves. A depository institution might borrow in the federal funds market if it finds that its reserve assets do not meet the amount required by law. It can borrow reserve deposits from another depository institution that has excess reserve deposits and chooses to lend them to earn interest. The reserve deposit balances are transferred between the borrowing and lending institutions using the Fed's wire transfer system. In recent years, many large depository institutions have used this market as a permanent source of funds to lend, not just when there is a temporary shortage of required reserve assets. As we saw in Chapter 2, the Fed has control over the cash assets available for reserves. The fed funds rate is the interest rate for borrowing and lending reserves in the fed funds market. If the Fed increases reserves, fewer depository institutions will need to borrow reserves and more will have excess reserves to lend. Ceteris paribus, the fed funds rate will fall and vice versa. In Chapter 10, we will see the importance of the fed funds rate in the implementation of monetary policy.

Eurodollars

Eurodollars
Dollar-denominated deposits held abroad.

Eurodollars are dollar-denominated deposits held in banks outside the United States. For example, if an American corporation makes a deposit denominated in U.S. dollars in a bank in England or some other foreign country, that is a Eurodollar deposit.[4] Eurodollar deposits are not subject to domestic regulations and are not covered by deposit insurance. Typical maturities are overnight to six months, and the average deposit is in the millions of dollars. The Eurodollar market started in the 1950s, when Soviet bloc governments put dollar-denominated deposits into London banks. The

3-4
The Principal Capital Market Instruments: Amount Outstanding, End of Year (in billions of dollars)

Type of Instrument	1960	1970	1980	1990	2000	2008[a]
Corporate stock	$451	$906	$1,920	$3,530.0	$17,627	$19,648.4[a]
Mortgages	142	297	965	3,804.0	6,886	14,720.1[a]
Corporate and foreign bonds	75	167	319	1,704.0	4,991	11,261.5[a]
U.S. government securities[b]	240	372	863	3,052.0	5,773	8,534.9[ab]
U.S. government agency securities	10	51	170	1,445.9	4,345	8,072.9[a]
Municipal securities	71	144	337	983.0	1,481	2,669.0[a]

a. As of September 30, 2008.
b. Includes Treasury notes and bonds held by the public and intragovernmental holdings such as those held by the Fed and the Social Security Administration.
Source: Federal Reserve Flow of Funds Accounts, Z.1 (December 11, 2008), at **http://www.federalreserve.gov/releases/Z1/**; *Federal Reserve Bulletin,* various issues; *Banking and Monetary Statistics 1941–1970,* various issues.

funds were deposited in London because the governments were afraid that if the deposits were in the United States, they would be frozen in the event of a flare-up of Cold War tensions. Despite the easing of tensions, the Eurodollar market continues to thrive. Today, many corporations and investors hold Eurodollar deposits in a foreign country if they have trade-related dollar transactions in that country. Large corporations dominate the market. U.S. banks can also borrow Eurodollar deposits from their own foreign branches when they need funds to lend and invest. In recent years, borrowings of Eurodollars have become an important source of funds for domestically chartered banks.

CAPITAL MARKET INSTRUMENTS

The capital market is extremely important because it raises the funds needed by net borrowers to carry out their spending and investment plans. A smoothly functioning capital market influences how fast the economy grows. The principal capital market

3-5
The Capital Market

Instrument	Typical Maturities	Principal Borrowers	Secondary Market
Corporate stock	—	Corporations	Very active for large corporations
Mortgages	15 to 30 years	Home owners and other investors	Moderately active
Corporate bonds	2 to 30 years	Corporations	Active
U.S. government securities			
Notes	2 to 10 years	U.S. government	Very active
Bonds	30 years	U.S. government	Very active
U.S. government agency securities	Up to 30 years	U.S. government agency	Active
Municipals	2 to 30 years	State and local governments	Active

instruments introduced in this section are listed in Exhibit 3-4, with the amounts outstanding at the end of 1960, 1970, 1980, 1990, 2000, and 2007. Exhibit 3-5 describes the typical maturities, principal borrowers, and degree of secondary market activity for these instruments.

Stocks

Stocks
Equity claims that represent ownership of the net assets and income of a corporation.

Stocks are equity claims representing ownership of the net income and assets of a corporation. The income that stockholders receive for their ownership is called dividends. Preferred stock pays a fixed dividend, and in the event of bankruptcy of the corporation, the owners of preferred stock are entitled to be paid first after the corporation's other creditors. Common stock pays a variable dividend, depending on the profits that are left over after preferred stockholders have been paid and retained earnings set aside.[5] The largest secondary market for outstanding shares of stock is the New York Stock Exchange. However, a growing share of trading is occurring on the NASDAQ, an electronic trading platform, and on other online networks over the Internet. Several stock indexes measure the overall movement of common stock prices; the Dow Jones Industrial Average, perhaps the best known, is based on the prices of only 30 stocks. The Standard & Poor's 500 Stock Index is based on the prices of 500 stocks of the largest companies in the United States. The value of all outstanding stock was just over $20.1 trillion in early 2000, exceeding the value of any other type of security in the capital market. Note the dramatic increase in stock values between 1990 and early 2000—due to the very bullish stock market. In early 2000, the value of stocks began to fall in the deepest bear market in history, with the outstanding value of stocks falling to less than $11 trillion by the end of the third quarter of 2002. After three successive years of decline, the stock market began to recover, and by mid 2007, the value of outstanding equities reached just under $23 trillion. After this peak, the stock market fell to less than $19 trillion in mid 2008 as the ongoing financial crisis impacted most stocks and devastated the stocks of failing financial institutions. The amount of new stock issues in any given year is typically quite small relative to the total value of shares outstanding.

Mortgages

Mortgages
Loans made to purchase single- or multiple-family residential housing, land, or other real structures, with the structure or land serving as collateral for the loan.

Mortgages are loans to purchase single- or multiple-family residential housing, land, or other real structures, with the structure or land serving as collateral for the loan. In the event the borrower fails to make the scheduled payments, the lender can repossess the property. Mortgages are usually made for up to 30 years, and the repayment of the principal is generally spread out over the life of the loan. Some mortgages charge a fixed interest rate that remains the same over the life of the loan; others charge a variable interest rate that is adjusted periodically to reflect changing market conditions. Savings and loan associations, commercial banks, and mortgage brokers are the primary lenders in the residential mortgage market. In recent years, there has been a great deal of innovation in the mortgage market, including the introduction of interest-only loans, where the principal is not spread out over the life of the loan. Such loans reduce the monthly payment because no principal is paid. By making monthly payments more affordable, interest-only loans contributed to the housing boom of the early- and mid-2000s. Unfortunately, other innovations such as subprime mortgages directly led to the housing price collapse and mortgage crisis in the late 2000s. Subprime mortgages were made to borrowers at low initial interest rates that would later reset to higher rates, often making payments unaffordable for the borrower. These loans and falling housing prices led to

the biggest housing bust and mortgage crisis in history. The crisis quickly spread to other domestic and global financial markets and is still plaguing the financial system in 2009. More on this ongoing crisis and the government response (or bailout) in later chapters.

Corporate Bonds

Corporate Bonds
Long-term debt instruments issued by corporations.

Corporate bonds are long-term bonds issued by corporations usually (although not always) with excellent credit ratings. Maturities range from two to 30 years. The owner receives an interest payment twice a year and the principal at maturity. Because the outstanding amount of bonds for any given corporation is small, corporate bonds are not nearly as liquid as other securities such as U.S. government bonds. However, an active secondary market has been created by dealers who are willing to buy and sell corporate bonds. The principal buyers of corporate bonds are life insurance companies, pension funds, households, commercial banks, and foreign investors. Bonds are rated by rating companies with regards to the probability of the issuing company being able to make payments when due. Bond issues with lower ratings are issued at higher interest rates to compensate for the increased risks.

U.S. Government Securities

U.S. Government Securities
Long-term debt instruments of the U.S. government with original maturities of two to 30 years.

U.S. government securities are long-term debt instruments with maturities of two to up to 30 years issued by the U.S. Treasury to finance the deficits of the federal government. Notes have an original maturity of two to 10 years; bonds have an original maturity between 10 and 30 years. At the present time, the Treasury sells newly issued fixed-rate two-, three-, five-, and 10-year notes and 30-year bonds in regularly scheduled auctions. Government notes and bonds pay semiannual dividends and return the principal at maturity. An active secondary market exists, although it is not as active as the secondary market for T-bills. Despite this, because of the ease with which they are traded, government securities are still the most liquid security traded in the capital market. In 1997, the U.S. government began issuing inflation-indexed securities with returns that were adjusted in response to changes in inflation. Inflation-indexed securities currently are issued with five-, 10-, and 20-year maturities. The principal holders of government securities are the Federal Reserve, financial intermediaries, securities dealers, households, and foreign investors.

U.S. Government Agency Securities

U.S. Government Agency Securities
Long-term bonds issued by various government agencies, including those that support real estate lending and student loans.

U.S. government agency securities are long-term bonds issued by various privately owned government-sponsored agencies, including those that support commercial, residential, and agricultural real estate lending and student loans. Active secondary markets exist for most agency securities. Even though the agency securities do not have explicit government guarantees, most have an implicit government guarantee, and it is assumed the government will step in to support the market in the event of a default.

The two largest issuers of government agency securities are the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac). Both are associated with the housing market. The proceeds from selling Fannie Mae and Freddie Mac securities are used to purchase mortgages. When the mortgages are purchased, new funds are provided to the mortgage market. Fannie Mae and Freddie Mac were caught up in the ongoing housing crisis that began in 2007. They had issued over $5 trillion in securities that would be paid from the payments on

the mortgages they had purchased. When there were large defaults on the mortgages, Fannie Mae and Freddie Mac did not generate the revenue to make payments to the lenders who had purchased their securities. Given the implicit government guarantee, the U.S. government ended up taking over the two giants on September 7, 2008. Although the owners of the Fannie Mae and Freddie Mac securities did not lose, the shareholders of Fannie Mae and Freddie Mac were almost wiped out. As of late 2008, the fate of Fannie Mae and Freddie Mac is unknown.

The Government National Mortgage Association (Ginnie Mae), which is actually a U.S. government agency that is part of the Department of Housing and Urban Development (HUD), ensures the timely payment of principal and interest on mortgages. Thus, Ginnie Mae also facilitates greater lending in the mortgage market. Because Ginnie Mae is part of the government, Ginnie Mae securities are full faith and credit obligations of the U.S. government just as Treasury securities are, and thus there was no crisis in this market.

State and Local Government Bonds (Municipals)

State and Local Government Bonds (Municipals)
Long-term instruments issued by state and local governments to finance expenditures on schools, roads, and so on.

Revenue Bonds
Bonds used to finance specific projects with the proceeds of those projects being used to pay off the bondholders.

General Obligation Bonds
Bonds that are paid out of the general revenues and backed by the full faith and credit of the issuer.

State and local government bonds (municipals) are long-term instruments issued by state and local governments to finance expenditures on schools, roads, college dorms, and the like. An important attribute of municipals is that their interest payments are exempt from federal income taxes and from state taxes for investors living in the issuing state. Because of their tax status, state and local governments can issue debt at yields that are usually below those of taxable bonds of similar maturity. They carry some risk that the issuer will not be able to make scheduled interest or principal payments.[6] Payments are generally secured in one of two ways. **Revenue bonds** are used to finance specific projects, and the proceeds of those projects are used to pay off the bondholders. **General obligation bonds** are backed by the full faith and credit of the issuer; taxes can be raised to pay the interest and principal on general obligation bonds. Households in high tax brackets are the largest holders of state and local government bonds.

In the next section, we discuss market makers. They are among the most important participants in financial markets because they facilitate the flow of funds from net lenders to net borrowers, and vice versa.

Recap

The major money market instruments are U.S. T-bills, negotiable CDs, commercial paper, bankers' acceptances, repurchase agreements, fed funds, and Eurodollars. The major capital market instruments are stocks, mortgages, corporate bonds, U.S. government securities, U.S. government agency securities, and municipals.

THE ROLE OF MARKET MAKERS

Market Makers
Dealers who link up buyers and sellers of financial securities and sometimes take positions in the securities.

The participants in financial markets are the buyers, sellers, and **market makers.** The market makers function as coordinators who link up buyers and sellers of financial instruments. The link involves arranging and executing trades. Market makers may make a market in only one type of security, say, Treasury bills, or in several different types of securities, including stocks and corporate and government bonds. Who are these market makers? Where are they located? Why do they exist? What does "making a market" entail? These are some of the questions to which we now turn.

Historically, since the Great Depression until 2008, the market makers had been investment banking firms. The main offices of these financial firms are in New York City, the financial capital of the United States. These offices are linked by telephone, telex, and the Internet to other major cities in the United States and the rest of the world where branch offices and regular customers are located. Like most enterprises, these firms are in business to earn profits. In this industry, profits are earned by providing financial services to the public. These services include giving advice to potential traders, conducting trades for the buyers and sellers of securities in the secondary market, and providing advice and marketing services to issuers of new securities in the primary market.

The packaging and marketing of newly issued stocks and bonds by a corporation in the primary market is *investment banking.* The term is potentially confusing, for it suggests that these market-making firms are banks; in fact, they are securities firms, not full-fledged banks, even though they provide some of the same services banks do. In recent years, in response to changing legislation that allowed them to do so, some large commercial banks merged with securities firms that perform investment banking services. Furthermore, in response to the financial crisis of 2008, the five largest investment banks that dominated the industry, have either gone out of business (Lehman Brothers declared bankruptcy), been purchased by a commercial bank (J.P. Morgan purchased Bear Stearns; Bank of America purchased Merrill Lynch), or changed their charter to a bank holding company (Goldman Sachs and Morgan Stanley). Thus, the five leading investment bank titans no longer exist as independent entities and are now part of the commercial banking industry. The investment banking structure as we know it is in the process of evolutionary (or some may say revolutionary) change.

Broker
A person who arranges trades between buyers and sellers.

Dealer
A person who arranges trades between buyers and sellers and who stands ready to be a principal in a transaction; a market maker.

Despite this, we believe that these securities firms will still operate as separate parts of the larger financial conglomerate. They will employ brokers and dealers. A **broker** simply arranges trades between buyers and sellers for a fee. A **dealer,** in addition to arranging trades between buyers and sellers, stands ready to be a principal in a transaction. More specifically, a dealer stands ready to purchase and hold securities sold by investors in secondary markets. The dealer carries an inventory of securities and then sells them to other investors. When we refer to market makers in this text, we will be referring to dealers and the securities firms for which they work.

As a key player in financial markets, the market maker has an important role in our financial system. In particular, a market maker helps to maintain a smoothly functioning, orderly financial market. Market makers stand ready to buy and sell and adjust prices—literally making a market. Let us assume that there are 100,000 shares of a stock for sale at a particular price. If buyers take only 80,000 shares at that price, what happens to the remaining 20,000 shares? When such a short-term imbalance occurs, rather than making inconsistent changes in prices, the market maker takes a position (buys) and holds shares over a period of time to keep the price from falling erratically. Or the market maker may alter prices until all, or most, of the shares are sold. Thus, in the short run, market makers facilitate the ongoing shuffling and rearranging of portfolios by standing ready to increase or decrease their inventory position if there is not a buyer for every seller or a seller for every buyer. These actions enhance market efficiency and contribute to an evenly balanced financial system.

Market makers also receive, process, interpret, and disseminate information to potential buyers and sellers. Such information includes the outlook for monetary and fiscal policy; newly published data on inflation, unemployment, and output; fresh assessments of international economic conditions; information on the profits of individual firms; and analyses of trends and market shares in various industries. As holders of outstanding securities and potential issuers of new securities digest all of this information,

they may take actions that bring about a change in current interest rates and the prices of stocks and bonds.

To illustrate, assume that the political situation in the Middle East deteriorates, and experts believe a prolonged war, which would disrupt the flow of oil to the rest of the world, is likely. Analysts employed by the market makers would assess the probable impact on the price of oil, the effect on U.S. oil companies' profits, and so forth. Such information would be disseminated to and digested by financial investors and lead some of them to buy (demand) or sell (supply) particular securities.

In general, when something affects the supply of or demand for a good, the price of that good will be affected. In the financial markets, when something affects the supply of or demand for a security, its price will move to a new equilibrium and the market maker will facilitate the adjustment. As a quick perusal of the newspaper reveals, security prices change almost every day. Because of the activity of market makers, these changes usually occur in an orderly and efficient manner.

Why Market Makers Make Markets

The willingness of a market maker to make a market for any particular security will be a function of the expected profits and risks associated with buying, selling, and holding that type of security. The profits earned by a market maker flow mainly from the revenue generated by the price it charges for conducting a transaction, the number of transactions engaged in, and any capital gains or losses associated with the market maker's inventory of securities. Generally, a market maker charges a brokerage fee or commission for each transaction. The fee may be per item, such as five cents per share of stock; per trade, such as $7 per trade; or a specified percentage of the total value of the trade, such as .5 percent of the total proceeds from a sale of bonds. Market makers also collect a fee in some markets by buying a particular security at one price—the **bid price**—and selling the security at a slightly higher price—the "offer" or **asked price.** In this case, the revenue received by a market maker is a function of the spread between the bid and asked prices and the number of transactions in which the market maker and the public engage. Competition among market makers tends to minimize transactions costs to market participants.

Bid Price
The price at which a market maker is willing to buy securities.

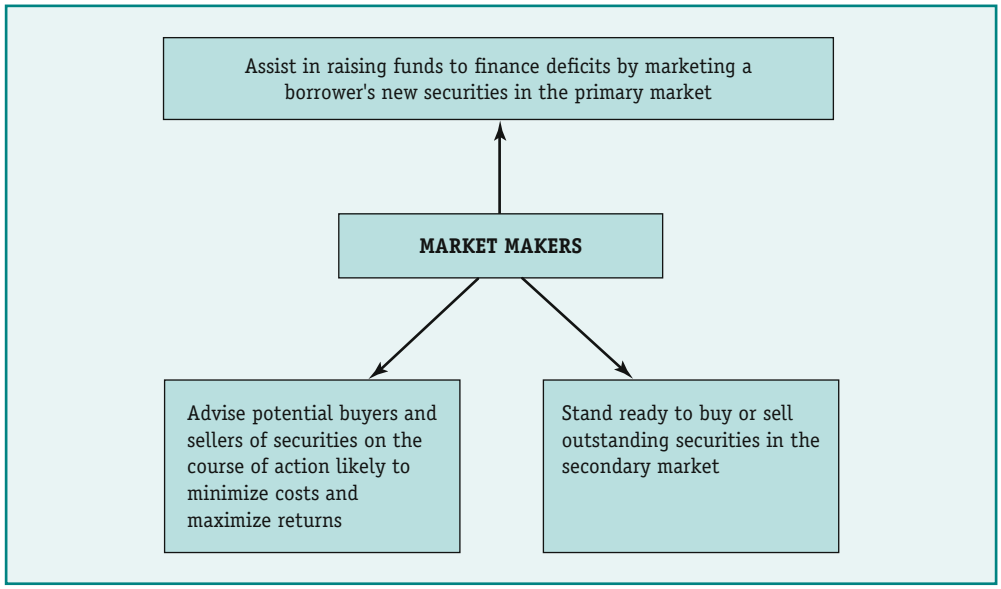
Asked Price
The price at which a market maker is willing to sell securities.

To sum up, market makers play a key role in facilitating the buying and selling of securities by the public, as outlined in Exhibit 3-6. First, market makers assist in raising funds to finance deficits by marketing a borrower's new securities in the primary market. Second, they advise potential buyers and sellers of securities on the course of action likely to minimize costs and maximize returns. Third, they stand ready to buy or sell outstanding securities in the secondary market. To illustrate these various roles, Exhibit 3-7 summarizes the trading of a bond issued by All Purpose Enterprise Inc. (APEI), a typical firm that wants to expand its scale of operations by building a new plant and acquiring additional inventories. Note the coordinating and connecting role played by Merrill Lynch and Smith Barney.

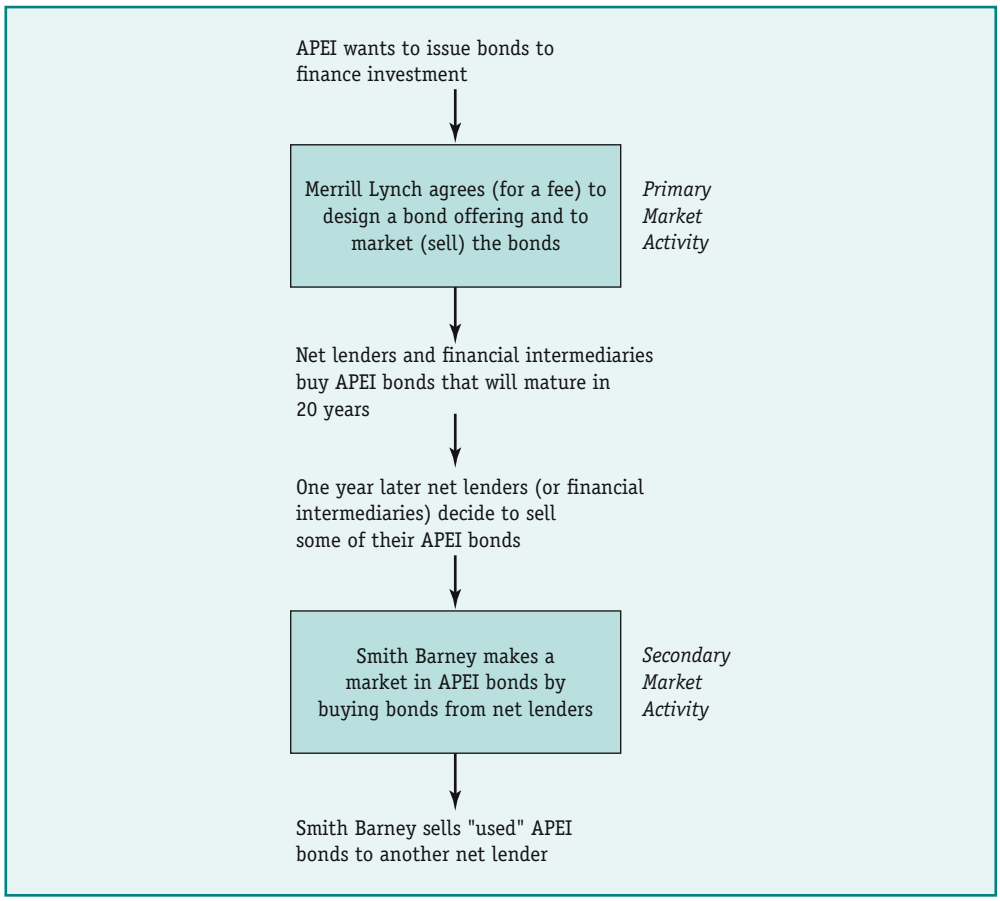
Market Making and Liquidity

The quality and cost of services provided by market makers affect the transactions costs associated with buying or selling various securities. The costs and convenience associated with trading particular securities, in turn, affect the liquidity of these securities. Because transactions costs and liquidity affect portfolio decisions, the market-making function influences the allocation of financial resources in our economy. Some markets, such as the T-bill market, are characterized by high-quality secondary markets. The

3-6
Market Makers



3-7
The Marketing and Subsequent Trading of a Corporate Bond



large volume of outstanding securities encourages many firms to make markets in Treasury securities, and the volume of trading and competition among market makers produces a spread between the dealer bid and asked prices of only 0.1 to 0.2 percent—well below the spread of 0.3125 to 0.5 percent associated with transactions in less actively traded, longer-term government securities.[7]

Substitutability, Market Making, and Market Integration

Market makers play another important but less obvious role in helping to integrate the various subsectors of financial markets. Market makers make markets in numerous financial instruments. In general, the trading floor of the typical market maker is a busy place. On the floor of the trading room, the specialist in T-bills sits near the specialist in corporate bonds, who, in turn, is only 20 feet from the specialist in mortgage-backed securities. Assuming that these people talk to one another, the activity in one market is known to those operating in other markets. With each specialist disseminating information to customers via telephone and continually monitoring computer display terminals, a noticeable change in the T-bill market (say, a half percentage point decline in interest rates on T-bills) will quickly become known to buyers and sellers in other markets. Such information will, in turn, influence trading decisions in these other markets and thus affect interest rates on other securities.

This spillover from one submarket to another is important in understanding the ties that bind the various compartments of financial markets together. The key concept underlying these linkages is the notion of substitutability. Whether they be bank managers or individuals allocating their own savings, portfolio managers monitor the expected returns on the array of financial assets available in financial markets. They compare the returns on assets in their portfolios to others available in the market. For example, if a higher, more attractive return becomes available on a Treasury bond as compared to a municipal bond already in the manager's portfolio, the manager may decide to sell the municipal security and buy the Treasury bond. This exchange of a lower-yielding security for a higher-yielding one is the essence of substitution. Assuming that many portfolio managers undertake similar actions, the net effect is to increase the supply in the municipal securities market and the demand in the Treasury bond market. Our market makers then act, in effect, as auctioneers, responding to such changes in supply and demand by changing the prices at which they are willing to buy or sell securities.

So far we have restricted our discussion to domestic financial markets. Yet for almost every domestic financial market, a corresponding foreign market exists. For example, there are markets for Japanese government securities, Hong Kong stocks, Canadian mortgage-backed securities, and Greek bonds. The same factors that affect the viability of domestic markets affect the substitutability between and among domestic and foreign instruments. Most financial markets are international in scope, as improvements in communication technologies have made the world a smaller place. Foreign instruments are good substitutes for domestic instruments in such a world, and vice versa. The activities of the market makers are critical to "greasing the wheels" that allow for this market integration.

Leaving the details aside, we have come full circle from the beginning of the chapter. We have seen that the numerous instruments traded in financial markets can be classified in many different ways; we have also seen that the separate markets for the individual instruments are linked by the activities of market makers and the willingness of traders to substitute among the alternative instruments available.

Before ending this discussion, note one other aspect about market makers. The traders obtain details on current interest rates, securities prices, and other information. Among many bits of data watched closely by all market makers is information relating to the operations of the Federal Reserve. In fact, if you asked these analysts and traders which type of information is most important, they would probably answer "information on Federal Reserve policy." Later in the text, we are sure you will be able to see why.

Summary of Major Points

1. The markets for particular types of financial claims are connected, not separate, entities. The connectedness of the markets results from the buying and selling (trading) of securities by the participants in the markets—that is, the substitution among available alternative instruments.
2. The money market is where securities with original maturities of one year or less are traded. The capital market is where securities with original maturities of more than one year are traded.
3. Primary markets are where new securities, issued to finance current deficits, are bought and sold. Secondary markets are where outstanding securities (issued earlier) are bought and sold. Secondary markets are important to the operation of an efficient financial system. Well-organized, smoothly functioning, high-quality secondary markets facilitate the trading of outstanding securities at relatively low cost and little inconvenience. This, in turn, facilitates the financing of planned deficits in primary markets.
4. The spot market is the market for the purchase or sale of securities for immediate delivery. In the futures and forward markets, contracts are entered into today to purchase or sell securities in the future at a price agreed upon today. Futures agreements are standardized with regards to quantities and delivery dates. Forward agreements are customized by banks and other brokers and dealers with regard to quantities and delivery dates to meet the needs of bank customers. Futures and forward markets are used to either reduce risk or speculate. Futures and forward markets are part of the growing derivatives markets where the financial instruments derive their values from some underlying instrument.
5. The principal money market instruments are U.S. Treasury bills (T-bills), negotiable certificates of deposit (CDs), commercial paper, bankers' acceptances, repurchase agreements, federal (fed) funds, and Eurodollars. The major capital market instruments are stocks, mortgages, corporate bonds, U.S. government securities, U.S. government agency securities, and state and local government bonds.
6. Market makers are the specialists who function as coordinators in financial markets and link up buyers and sellers of securities. They serve three important functions: (1) they disseminate information about market conditions to buyers and sellers; (2) they connect the various markets by buying and selling in the market themselves; and (3) they provide financial services that determine the quality of primary and secondary markets. In turn, the quality of the primary and secondary markets affects the ease or difficulty associated with financing deficits, lending surpluses, and, more generally, shifting into and out of various financial instruments.
7. Investment bankers assist corporations in the issuance of new stocks and bonds. Securities firms provide investment banking services. In recent years, securities firms and commercial banks have merged. In response to the financial crisis of 2008, the five largest investment banks have all either gone out of business or been assimilated into a commercial banking institution.

8. Dealers are market makers and their actions contribute to the smooth functioning of financial markets. They buy securities at bid prices and sell securities at asked prices. Their profit consists of the spread between the bid and asked prices and any price appreciation of the securities they hold.
9. Most domestic financial markets have a comparable foreign market, such as a foreign stock market. Market makers have assisted in integrating domestic and foreign financial markets.

Key Terms

Asked Price, p. **59**
Bankers' Acceptances, p. **51**
Bid Price, p. **59**
Broker, p. **58**
Capital Market, p. **46**
Commercial Paper, p. **51**
Corporate Bonds, p. **56**
Dealer, p. **58**
Derivative Markets, p. **48**
Eurodollars, p. **53**
Federal (Fed) Funds, p. **53**
Financial Forward Markets, p. **47**
Financial Futures Markets, p. **47**
General Obligation Bonds, p. **57**
Market Makers, p. **57**
Money Market, p. **46**
Mortgages, p. **55**
Negotiable Certificates of Deposit (CDs), p. **51**
Primary Market, p. **46**
Repurchase Agreements, p. **53**
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State and Local Government Bonds (Municipals), p. **57**
Stocks, p. **55**
Term to Maturity, p. **46**
U.S. Government Agency Securities, p. **56**
U.S. Government Securities, p. **56**
U.S. Treasury Bills (T-bills), p. **50**

Review Questions

1. Distinguish between primary and secondary markets and between money and capital markets.
2. The secondary market for T-bills is active, and the secondary market for federal agency securities is limited. How does this affect the primary market for each security? Why are well-developed secondary markets important for the operation of an efficient financial system?
3. What is the difference between financial futures and financial forward markets? What are derivative markets? What are the ways derivatives can be used?
4. Discuss the major function of market makers in securities markets. What is the difference between a broker and a dealer?
5. If you call a local brokerage firm, you will find that the commission or brokerage fee charged for purchasing $10,000 of T-bills is less than the fee associated with purchasing $10,000 of, say, municipal bonds issued by the City of Cincinnati. Explain why.
6. Explain why it would be incorrect to view the various sectors of the financial markets as totally separate entities.
7. Define *commercial paper*, *negotiable certificates of deposit*, *repurchase agreements*, *bankers' acceptances*, *federal funds*, and *Eurodollars*. In what ways are they similar, and in what ways are they different?
8. What are mortgages?
9. Define and contrast *stocks* and *bonds*. What are the advantages of owning preferred stock? What are the advantages of owning common stock?
10. What is the difference between a government security and a government agency security? Which asset would you prefer to own if safety and liquidity were important to you?
11. Would you rather own the stocks or bonds of a particular corporation if you believed that the corporation was going to earn exceptional profits next year?
12. Why are municipals attractive to individuals and corporations with high incomes or profits?
13. Can the bid price ever be greater than the asked price?

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

✓14. Rank the following financial instruments in terms of their safety and liquidity:
   a. U.S. T-bills
   b. Large negotiable CDs
   c. Mortgages
   d. Government bonds
   e. Government agency securities
   f. Commercial paper
   g. Eurodollars

✓15. In June 2010, John pays $9,800 for a one-year T-bill that can be redeemed for $10,000. What is the amount of interest earned? What is the yield?

Suggested Readings

Information on T-bills can be found at **http://www.treasurydirect.gov/indiv/products/prod_tbills_glance.htm.**

Fed funds transactions are discussed at **http://www.newyorkfed.org/.**

Two older books that may be of interest are *The Money Market*, rev. ed. (Homewood, IL: Dow Jones-Irwin, 1990), and *Handbook of Securities of the United States Government and Federal Agencies, and Related Money Market Instruments* (First Boston Corporation, July 1990).

Additional Fed publications explaining fed funds, repurchase agreements, and government securities can be accessed online at **http://www.newyorkfed.org/publications/result.cfm.**

For a discussion of the commercial paper market, see Mitchell Post, "The Evolution of the U.S. Commercial Paper Market Since 1980," *Federal Reserve Bulletin* (December 1992). For recent trends in the commercial paper market, see Pu Shen, "Why Has the Nonfinancial Commercial Paper Market Shrunk Recently?" *Economic Review*, Federal Reserve Bank of Kansas City 88:1 (First Quarter 2003): 55–76. Yields on financial and nonfinancial commercial paper can be seen at **http://www.economagic.com/fedbog.htm.**

Some articles dealing with the stock market boom of the late 1990s follow: Nathan S. Balke and Mark E. Wohar, "Why Are Stock Prices So High? Dividend Growth or Discount Factor?" *Federal Reserve Bank of Dallas Working Paper No. 00–01* (January 2000); Simon Kwan, "Three Questions About 'New Economy' Stocks," *FRBSF Economic Letter*, Federal Reserve Bank of San Francisco, No. 2000–15 (May 12, 2000); William R. Nelson, "Why Does the Change in Shares Predict Stock Returns?" *Finance and Economics Discussion Series*, Board of Governors of the Federal Reserve System, No. 1999–06 (1999).

Endnotes

1. The terms financial claims, instruments, or securities can be used interchangeably.
2. Many money market instruments such as U.S. government and agency securities are also sold in much smaller denominations for individual investors.
3. Individuals can bid on and purchase T-bills directly from the federal government at **www.treasurydirect.gov.**
4. Eurodollars must be distinguished from foreign deposits that are denominated in the currency of the host country. For example, a foreign deposit results when an American converts dollars to British pounds and deposits them in a bank in England with the deposit denominated in pounds.
5. Note that the board of directors of a corporation may choose not to pay common stockholders dividends even if the corporation has profits left over after preferred shareholders have been paid. In this case, the income that stockholders receive will be in the form of capital gains if the stock appreciates because of the retained earnings.

6. In mid-1995, investors in Orange County, California, found out firsthand about the risks of municipal bonds after the county declared bankruptcy in December 1994. The bankruptcy resulted from a $1.7 billion loss in the county's investment portfolio due to reckless risk taking in financial markets.
7. Spreads between dealer bid and asked prices for corporate bonds range up to 2 to 3 percent for securities with relatively low marketability.

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CHAPTER FOUR

4

Presume not that I am the thing I was.

—William Shakespeare

An Introduction to Financial Intermediaries and Risk

Learning Objectives

After reading this chapter, you should know:

The characteristics common to all types of financial intermediaries (FIs)

The services provided by FIs

The types of risks FIs must manage

The principal assets and liabilities of the major FIs

ARE ALL FINANCIAL INTERMEDIARIES MORE OR LESS ALIKE?

It is the last day of the month. Sandi and Dave have both been paid by their employers, and it's now time to pay the family's bills and save something for their upcoming vacation. Sitting at the kitchen table, they write checks on their account at HLT National Bank to Prudential Insurance Company for the premium due on Sandi's life insurance policy, APEI Credit Union for the car loan payment, and the local savings and loan (S&L) association for the mortgage payment. When these and other bills are paid, a check for the surplus funds to be saved is sent to their money market mutual fund account at Vanguard.

In this hypothetical series of transactions, Sandi and Dave dealt with five different financial intermediaries (FIs): a commercial bank, an insurance company, a credit union, an S&L, and a money market mutual fund. Why five instead of one? Can't one provide all of the relevant services? Put another way, how are these intermediaries similar to one another, and how do they differ? This chapter will examine the characteristics and roles of those institutions that provide the public with a wide range of financial services and play a central role in coordinating and channeling the flow of funds in the economy.

Financial Innovation
The creation of new financial instruments, markets, and institutions in the financial services industry.

As we begin, we should emphasize that **financial innovation,** which is the creation of new financial instruments, markets, and institutions, has been the key to growth and survival in the financial services industry in the last 45 years.[1] Institutional details in the financial services industry are currently evolving at a rapid pace due to changes in technology and the globalization of finance. In a few years or sooner, Sandi and Dave may be paying their monthly bills as they sit in front of a computer terminal, and many of their payments may be made automatically from their checking account. After all, many households already do just that. In subsequent chapters, we analyze the forces that have previously produced major changes in the financial system and are likely to remain influential in the future.

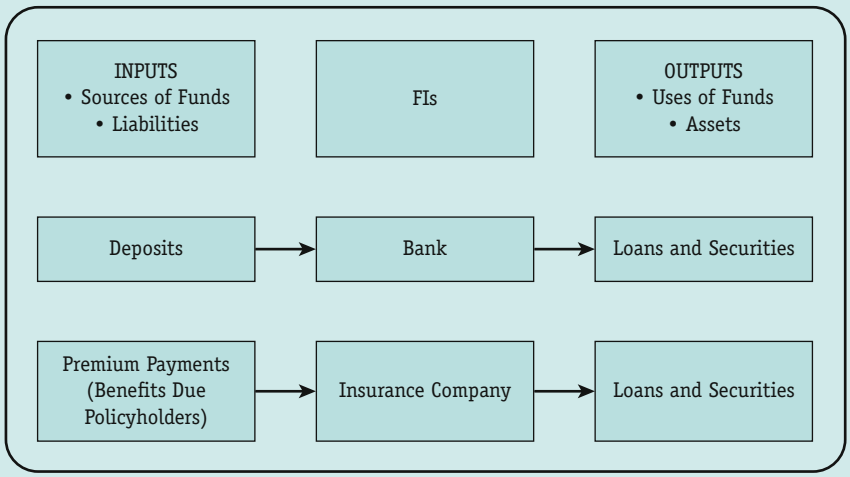
COMMON CHARACTERISTICS

Financial intermediaries (FIs) link up net borrowers and net lenders and, in the process, provide the public with a wide range of financial services. Recall from Chapter 1 that a *net lender* is a spending unit such as a firm or household for which spending on consumption and investment is less than income. Likewise, a *net borrower* is a spending unit for which spending is greater than income. The linking function involves the acquisition of financial claims on net borrowers by the FIs and the acquisition of claims on the FIs by net lenders. The net borrowers sell financial claims against themselves, which the intermediaries purchase. The financial claims may be signed loan papers, equities, or securities. In this context, when we say FIs make loans to net borrowers, the FIs are purchasing financial claims, which are the signed loan papers, from the net borrowers. The intermediaries get the funds to lend by selling their own financial claims that the net lenders purchase. The financial claims against the FIs include checking, time, and savings deposits, among others. Even though funds flow ultimately from net lenders to net borrowers, the intermediaries do more than act as a go-between. The net lenders acquire claims against the FIs, which sell their own liabilities; thus, the FIs are in debt to the net lenders.[2]

FIs, along with the investment banking and securities firms we met in the last chapter, make up the *financial services industry.* In the process of acquiring and providing funds, FIs provide the public with a wide range of financial services. FIs are by and large profit seeking.[3] In this context, this means that FIs provide financial services because

FIs as Firms

FIs are firms. We generally think of, say, manufacturing firms as acquiring inputs, including land, labor, and capital, and using these inputs to produce outputs. In the case of FIs, their inputs are their liabilities, or sources of funds. These funds are used to extend loans and acquire securities. Such financial claims are their assets and represent the outputs of the FIs. Banks, for example, incur deposit liabilities as a source of funds and use the funds to increase their asset holdings of loans and securities. Insurance companies receive premium payments from policyholders (inputs) and use the funds received to acquire assets—mainly loans and securities (outputs).



doing so is profitable. The quantity, quality, and type of financial services offered will expand or contract as the perceived profitability of this activity changes.

To illustrate, banks "hire" funds from depositors. The interest a bank pays on its deposits is a cost of doing business, akin to the wages a manufacturing firm pays its workers. The bank then lends out the funds it acquires to consumers, businesses, and governments. The interest earned on the loans represents revenue to the bank, akin to the revenue generated by a manufacturing firm's sales. Leaving some details aside, the difference between the interest earned and the interest paid is a primary determinant of the bank's profitability. If funds can be hired more cheaply by providing a new type of deposit service, FIs have an incentive to act accordingly. Similarly, if a particular type of lending turns out to be less profitable than expected, FIs have an incentive to lend less in this area or to attempt in some way to increase the expected revenue associated with such lending. As we shall see, the link between expected profitability and the specific services provided by FIs is a crucial part of the explanation of why FIs change over time.

The public demands financial services provided by FIs to reduce the risks and costs associated with borrowing, lending, and other financial transactions, and to fulfill the demand for various financial assets and services, including protection against the financial losses associated with various exigencies.

FIs use their expertise to appraise the risk of default associated with lending to particular borrowers. They usually do a better job of assessing these risks than individuals could do on their own. FIs pool the surpluses of many net lenders and lend to thousands of net borrowers. **Diversification** is spreading out the individual surpluses of net lenders among numerous borrowers. As long as the returns to different assets fluctuate differently diversification reduces the risk of losses for net lenders. Risk is diffused among thousands of borrowers, all of whom are not likely to default at the same time. The net lenders are no longer putting all of their eggs in one or a few baskets.

Diversification
The allocation of surplus funds to more than one financial instrument in order to reduce risk.

On the flip side, by buying the financial liabilities of net borrowers, the FIs provide borrowing opportunities for net borrowers. The liabilities may be long- or short-term loans, stocks, bonds, or other financial claims. Without the FIs, the net borrowers would have to rely on direct finance and would have far fewer or no borrowing sources. If there were no FIs, think how difficult it would be for most individuals to find someone to lend them funds to purchase a new car, or for most firms to borrow to purchase new machinery and equipment. When they did borrow, undoubtedly net borrowers would be charged higher interest rates to compensate for the greater risks. Thus, the significant overall economic function of financial intermediation is to facilitate borrowing and lending that result in capital formation (plant, equipment, and the like) and in other investment spending.

In addition, FIs provide a menu of financial claims and depository services tailored to meet the needs of net lenders. The menu includes relatively safe and liquid claims, such as checking, time, and savings deposits at banks and other depository institutions. The financial claims issued by depository institutions are insured up to $250,000 in 2009; therefore, they are much safer assets than financial claims that are not insured. Because many are paid on demand (checkable deposits) or with minimal hassle (time and savings deposits), some financial claims are much more liquid than other claims. If I make a loan to an individual borrower and an unexpected need arises whereby I need the funds back before the due date, the borrower may be unable or unwilling to pay me back early. Liquidity would not be a problem if I had my funds in insured checkable, savings, or time deposits.

Contingent Claims
Claims such as casualty and life insurance benefits that offer the public protection from the often-catastrophic financial effects of theft, accidents, natural disasters, and death.

FIs such as casualty and life insurance benefits offer the public a menu of **contingent claims** that provide some protection from the often catastrophic financial effects of theft, accidents, natural disasters, and death in exchange for regular premium payments. Again, the premium payments are collected from thousands of policyholders, and the guarantees spread out or diffused over the same policyholders.

With FIs playing such a vital role in the economy, it should not be surprising that they share another common feature. They are regulated by various levels and agencies of government. Government regulators establish and enforce operating regulations aimed at promoting a smooth-running, efficient financial system and protecting the public from fraud and other abusive practices. The regulators seek to promote competition in the market for financial services while preserving the public's confidence in the safety and soundness of the system.

Regulations represent an attempt to constrain or restrict an activity that might otherwise occur. In the financial system, regulations take on many forms. Entry into the industry is tightly controlled. For example, someone cannot just open a bank. A charter from the federal government or relevant state government is needed. There are

also restrictions on the particular types of assets and liabilities that specific FIs can acquire. S&Ls, for example, cannot acquire common stock. In the past, regulations limited the interest rates that FIs could pay on certain types of deposits and charge on certain types of loans. In addition, regulations have historically restricted the geographical areas in which some FIs could operate, although such restrictions have, for the most part, been eliminated.

Financial system regulations, examined in detail in Chapter 17, have had at least three major effects:

1. For quite a while, they tended to reinforce and encourage specialization by FIs in particular financial services. For example, life insurance companies stuck pretty much to providing life insurance, and S&Ls stuck to purchasing mortgages. More directly, the regulations tended to limit competition among different types of FIs.
2. Such specialization helps to explain the different types and mix of assets and liabilities that individual FIs hold.
3. Over time, FIs increasingly saw the benefits of diversifying. In other words, they saw that providing the public with a wider range of financial services could be profitable. Attempts to move in such a direction often involved innovations that got around some existing regulations, particularly restrictions that limited the range of services that FIs could provide and the competition among FIs in general. As you shall see in Chapters 15 and 17, legislation in late 1999 allowed commercial banks, securities firms, and insurance companies to affiliate under common ownership. Thus, one firm can offer its customers a complete range of financial services.

As we shall see, Sandi and Dave, whom we met at the beginning of the chapter, may be dealing with far fewer than five FIs if they do business with a one-stop financial conglomerate that offers an array of financial services.

Recap FIs possess many common traits. In general, they are regulated, profit-seeking firms that provide the public with a wide range of financial services. These services help to reduce the risks associated with channeling funds from net lenders to net borrowers. The services provided include the appraisal and diversification of risk, the pooling of funds, and the provision of a menu of claims, including contingent claims, tailored to the needs of customers.

TYPES OF RISKS FACED BY ALL FIs

FIs are faced with different types of risk in varying degrees, depending on the composition of their assets and liabilities. We first review the types of risks common to all intermediaries and net lenders and net borrowers in general.

Credit or Default Risk

Default Risk
The risk that a borrower will be unwilling or unable to live up to the terms of the liability it has sold.

Credit or **default risk** is the risk that the borrower will be unwilling or unable to live up to the terms of the liability it has sold. Perhaps the borrower is a firm that uses the funds for expansion, but the business it thought would boom turns out to be a bust because of some unanticipated complication or a general slowdown in the economy. For whatever reason, when making a loan or buying a financial security issued by a borrower, the FI, whether it be a bank, mutual fund, or insurance company, is exposed to the risk that the borrower will default.

A primary function of the management of an FI is to evaluate the credit risk associated with purchasing the financial claims of net borrowers such as firms, individuals, and domestic and foreign governments. To do this, FIs employ experts in risk assessment who generally do a better job of assessing default risks than individuals could do on their own. Managers of FIs must be aware that they are making decisions under conditions of asymmetric information. **Asymmetric information** means that a potential borrower or issuer of securities knows more about the risks of an investment project than the FI's managers (the individuals who have to make the funding decision). Thus, the borrower and the lender do not have equal, or symmetric, information. After all, don't many of those who apply for a loan or issue securities obviously try to put their best foot forward and conceal any blemishes? In addition, those with the most to hide and those willing to take the biggest risks are often the most likely to be less than forthright and/or to pursue borrowing most diligently. If the net lenders fund these less-desirable borrowers, the result is an **adverse selection problem,** which increases the risk of default.

Asymmetric Information
When a potential borrower knows more about the risks and returns of an investment project than the bank loan officer does.

Adverse Selection Problem
When the least-desirable borrowers pursue a loan most diligently.

Moreover, after the loan is made or a security is purchase by an FI, it may be difficult to guarantee that the funds are used only for the stated purpose and not for a more risky venture. This so-called **moral hazard problem** results from the fact that once borrowers get the funds, they may have an incentive to engage in a more risky venture, because higher-risk ventures pay a higher return. After all, the borrowers are not risking their own funds. If the borrowers win, they keep the bigger profits; but if they lose, the lender bears the loss.

Moral Hazard Problem
When the borrower has an incentive to use the proceeds of a loan for a riskier venture after the loan is funded.

In reality, managing credit risk does not mean denying loans to all borrowers who may default or failing to make any investments that could go sour. Maintaining and enhancing profitability in the financial services industry, as in other industries, entails taking some risks. The future is uncertain. Unforeseen events can turn an otherwise profitable endeavor into a losing and perhaps bankrupt situation. Thus, a "good" credit risk can become a "bad" investment. A fact of economic life is that despite good intentions, decent planning, and a successful track record, some borrowers will default. Conversely, some who have experienced financial difficulties in the past will "turn the corner" and become quite profitable.

The task of financial managers is to lend and invest prudently. In general, this means gathering all relevant information on potential borrowers and using this information to avoid exposing the FI to excessive risk. The information should include income statements, credit checks, net worth, how funds are to be used, and so on. Recognize that the words *prudent* and *excessive* are somewhat nebulous. An FI's management team must establish guidelines that quantify the terms. Losses will occur. The trick is to cover the losses with profits on other loans and investments.

Interest Rate Risk

Interest Rate Risk
The risk that the interest rate will unexpectedly change so that the costs of an FI's liabilities exceed the earnings on its assets.

Another type of risk that must be managed is the **interest rate risk.** This is the risk that the interest rate will unexpectedly change so that the costs of an FI's liabilities exceed the earnings on its assets. This risk emanates from the relationship between the interest rate earned on assets and the cost of, or interest rate paid on, liabilities. An FI's profitability is directly related to the spread between these rates. FIs obviously strive for a large positive spread in which the return on assets significantly exceeds the cost of liabilities.

For example, FIs often borrow short term through savings deposits or commercial paper and make long-term loans or purchase long-term fixed rate financial assets, such as bonds or mortgages. When FIs borrow short and lend long, they are exposed to an interest rate risk. If the interest rate goes up, the cost of the short-term liabilities rises

much more quickly than the returns on the long-term assets. Profits are reduced or can even turn into a losses.[4] This risk was a chronic problem for some intermediaries, particularly the S&L industry during the 1970s and 1980s, when the financial system was deregulated and interest rates fluctuated over a fairly wide range. FIs have responded to this changing environment in a variety of ways, including using adjustable rate loans. Rates on adjustable loans change as market interest rates change. FIs have also made extensive use of financial futures, options, and swaps options to hedge interest rate risk. These instruments will be analyzed in detail in Chapter 23.

Liquidity Risk

Liquidity Risk
The risk that an FI will be required to make a payment when the intermediary has only long-term assets that cannot be converted to liquid funds quickly without a capital loss.

Liquidity risk is the risk that an FI will be required to make a payment when the assets that the intermediary has available to make the payment are long term and cannot be converted to liquid funds quickly without a capital loss. Such a situation could occur when depositors unexpectedly withdraw funds or when an insurance company incurs unexpectedly high claim losses as a result of an earthquake, fire, flood, or hurricane. All intermediaries may experience a sudden unexpected need for funds, but depository institutions are particularly vulnerable to a deposit run that can cause a financial crisis: their reserves are only a fraction of their liabilities and those liabilities are often payable on demand. The Fed stands ready to provide liquidity for depository institutions by acting as a lender of last resort. FIs can reduce their liquidity risk by holding highly liquid assets that can be converted quickly into the funds needed to meet unexpected withdrawals or contingencies. They can also make other arrangements such as backup lines of credit to meet unexpected needs.

Exchange Rate Risk

Exchange Rate Risk
The risk that changes in the exchange rate will adversely affect the value of foreign exchange or foreign financial assets.

Economies have become increasingly international and global. As a consequence, many large FIs and other corporations maintain stocks of foreign currencies that are used in international transactions. In addition, some FIs may hold financial assets that are denominated in foreign currencies, such as foreign stocks or bonds. Exchange rates between various currencies fluctuate day-by-day and minute-by-minute based on the forces of supply and demand. An FI, like any holder of foreign exchange or foreign financial assets, is subject to an **exchange rate risk,** where changes in exchange rates cause the dollar value of foreign currency or foreign financial assets to fall. For example, assume that an FI holds 10,000,000 yen or a financial asset valued at 10,000,000 yen. If the exchange rate is \$1=100 yen, then 10,000,000 yen are worth \$100,000 because (10,000,000 yen)/(100 yen)=\$100,000/\$1. If the dollar exchange rate increases to \$1 equals 200 yen, then the 10,000,000 yen are worth only \$50,000 because (10,000,000 yen)/(200 yen) equals \$50,000/\$1. A loss is incurred that is proportional to the amount of foreign currency or foreign financial assets that are held and to the change in the exchange rate. As you shall see in Chapter 23, foreign exchange forward contracts, futures, options, and swaps can be used to mitigate this risk. Exhibit 4-1 summarizes the types of risks faced by all intermediaries.

Recap All FIs face several risks in varying degrees. Default risk is the risk that the borrower will not pay the financial claim. Asymmetric information is when a potential borrower knows more about the risks of an investment project than the lender. Adverse selection is when the least desirable borrowers pursue borrowing most diligently. Moral hazard is when a borrower has an incentive (the potential for higher profits) to use the borrowed funds for

4-1
Types of Risks Faced by Financial Intermediaries

Default Risk—The risk that the borrower will not pay the principal and interest on a financial claim when due.

Interest Rate Risk—The risk that changes in interest rates will reduce or eliminate a positive spread between assets and liabilities, thereby leading to potential losses.

Liquidity Risk—The risk that an intermediary will need to make a payment and not have liquid funds available to do so because its long-term assets cannot be liquidated quickly without loss of value.

Exchange Rate Risk—The risk that FIs that are holding stockpiles of foreign currencies or financial assets denominated in foreign currencies experience losses because of adverse changes in exchanges rate between the currencies.

a more risky venture. Interest rate risk is the risk that will occur when changes in the interest rate will turn a profitable spread into a loss. Liquidity risk is the risk that funds will not be available when needed. Exchange rate risk occurs when changes in exchange rates will cause the FI to experience losses in the dollar value of foreign currency or foreign financial assets.

A GUIDE TO FIs

The assets of FIs are financial claims such as loans and securities. The liabilities are financial liabilities such as deposits and borrowed funds. Various intermediaries hold different kinds of assets and liabilities. For any FI, net worth is the excess value of assets over liabilities. If the value of liabilities exceeds the value of assets, call the bankruptcy lawyer!

The nature of the liabilities sold by a particular type of FI bears a close relationship to the nature of the assets it acquires. More specifically, the maturity, stability, riskiness, and liquidity of an FI's liabilities affect the types of assets the FI chooses to purchase. In other words, the structure of an FI's assets and liabilities affects the exposure to the specific risks discussed in the preceding section and how it must manage each.

Deposit-Type FIs

Thrifts
Depository institutions known as S&Ls, savings banks, and credit unions.

Depository institutions include commercial banks, S&Ls, savings banks, and credit unions. The S&Ls, savings banks, and credit unions are called **thrifts.** As the term *depository institution* implies, a large portion of the liabilities of these FIs are deposits. The depository institutions have issued the deposits in order to obtain funds (inputs) that can be used to make loans and other investments (outputs). Deposit-type FIs are also important in the nation's money supply process because many of their deposit liabilities are checkable deposits.[5] Let's take a closer look at the institutions within this category.

Commercial Banks
Depository institutions that issue checkable, time, and savings deposit liabilities and, among other things, make loans to commercial businesses.

Commercial Banks

The word *bank* is derived from the Italian word *banca*, which refers to the "table, counter, or place of business of a money changer." Although modern banks bear little physical resemblance to ancient money changers, their functions remain quite similar. In modern parlance, **commercial banks** are typically defined as institutions that issue

checkable deposit liabilities and extend loans to commercial businesses. These two characteristics help to differentiate banks from other FIs; but, of course, banks do many other things, too. For example, banks also issue time and savings deposits and offer many other types of loans, including mortgages and consumer loans. In addition, they provide electronic funds transfers, debit cards, international trade-related payments, credit cards, leasing, trust services, financial guarantees, and advisory and accounting services. Chapter 15 tells more about bank services.

A bank's success depends on many factors, but especially important is its ability to attract funds by offering deposit liabilities. Deposits fall into three categories: transactions deposits, savings deposits, and time deposits. **Transactions deposits** (checkable deposits) can be exchanged for currency and are used in transactions to make payments to others by transferring the deposit claim; the transfer is made by writing a check or making an electronic transfer. **Savings deposits** cannot be withdrawn by writing a check but are highly liquid. By custom, banks usually allow withdrawals on demand, although a waiting period could be required. **Time deposits** have a scheduled maturity, and if funds are withdrawn before that date, there is a penalty, usually the forfeiture of some interest that has already been earned. As you first saw in Chapter 2, another kind of account, a money market deposit account, has the characteristics of both transactions and savings deposits.[6] Deposits are by far the main source of bank funds; consequently, banks continually strive to increase deposits. In addition, in recent decades, banks have developed other nondeposit sources of funds such as borrowing in the fed funds, repurchase agreements, and Eurodollar markets. A bank's success depends on local and regional factors, such as the population and economic vitality of the bank's service area and its ability to attract deposits away from competing FIs or from banks in other geographical regions. National factors and monetary policy are also important in determining a bank's success.

Transactions Deposits
Deposits that can be exchanged for currency and are used to make payments through writing a check or making an electronic transfer.

Savings Deposits
Highly liquid deposits that can usually be withdrawn on demand but not by writing a check.

Time Deposits
Deposits that have a scheduled maturity and a penalty for early withdrawal.

A bank must decide how best to use its funds to meet its objectives. One obvious objective is to maximize profits. Stockholders will see to it that the bank's management does not lose sight of this goal. Banking can be a risky business, however, and the management and stockholders will also want to minimize the risks faced in the pursuit of profits. In particular, the bank will try to diversify its portfolio in a way that will ensure a considerable margin of liquidity and safety. Banks seek safety because they are highly leveraged institutions; that is, their assets are overwhelmingly supported by borrowed funds, which are either deposit or nondeposit liabilities. Banks hold a mix of loans (including business loans, consumer credit, and mortgages), government securities, municipal securities, corporate and foreign bonds, and other assets. In late 2008, banks' holdings of real estate loans (mortgages) were 75 percent greater than their holdings of business loans. This represents a dramatic change over the past 30 years, because business loans were traditionally the lending venue for banks, while mortgages were held primarily by S&Ls. It also made many banks vulnerable to the collapse in the subprime mortgage markets in 2007–2008. With the passage of legislation in 1999, banks may also underwrite and deal in municipal revenue bonds.

In addition to these interest-earning assets, banks also hold reserve (cash) assets to help meet their liquidity and safety objectives. Another reason that banks hold reserve assets is that the Fed forces them to do so. As we first saw in Chapter 3, the Fed sets reserve ratios that require banks to possess reserve assets equal to a certain percentage of checkable deposit liabilities.

Banks' concerns about liquidity are generated in part by the nature of their sources of funds. For example, checkable deposits, which are obviously payable on demand, can and often do fluctuate widely. Nondeposit liabilities have the potential to fluctuate even more. For example, if a bank's solvency is questioned or if another depository institution

offers more attractive rates, a bank can quickly lose some nondeposit funds such as fed funds, repurchase agreements, and Eurodollar borrowings that are usually placed for a relatively short time period.[7] When deposits and nondeposit liabilities fall, even the most solvent bank must have a cushion of liquidity to enable it to meet these withdrawals. Such liquidity needs can be satisfied by holding some highly liquid assets, such as Treasury bills and non-interest-bearing cash reserves. Banks may also hold liquid assets so they will be able to accommodate unexpected loan demand from valued customers. If profits were all that mattered, a bank would never hold a Treasury bill yielding, say, 5 percent if another equally safe asset such as a guaranteed student loan yielding, say, 6 percent were available. However, the liquidity of Treasury bills in effect provides an implicit return to banks in addition to the explicit yield.

Guided by its liquidity, safety, and earnings objectives, a bank must make portfolio decisions regarding the optimal mix of loans, securities, and reserves that it will hold. Simply put, this means the bank must decide on the best way to use its funds.

The *capital base* (or net worth) is the value of the bank's assets less the value of its liabilities. In general, the smaller the capital base, the more vulnerable the bank is to adverse developments. Assume that some of a bank's larger loans go sour. The borrowers default and fail to pay the principal and interest due. These defaults will reduce the cushion provided by the bank's capital base and push the bank toward insolvency and bankruptcy. For example, suppose the bank's capital base amounts to 8.4 percent of assets. Thus, for every $1,000,000 in assets, the bank holds only $84,000 in capital. If loans are 65 percent of assets, then loans amount to $650,000 ($.65 \times \$1{,}000{,}000$). The bank's capital will be gone if 12.9 percent of its $650,000 loans go sour because $84,000 is 12.9 percent of $650,000 ($\$84{,}000 = .129 \times \$650{,}000$). This is an equivalent way of saying that the bank has lost all of its capital. Thus, regulators are concerned that banks maintain adequate capital.

Savings Associations

Savings Associations
Savings and Loan Associations and Savings Banks.

Savings and Loan Associations (S&Ls)
Depository institutions established for the purpose of pooling the savings of local residents to finance the construction and purchase of homes; have offered checkable deposits since 1980.

Savings Banks
Depository institutions set up to help finance the construction and purchase of homes; located mainly on the East Coast.

Savings associations include S&Ls and savings banks. **Savings and loan associations (S&Ls),** originally known as *building and loan associations*, were founded in the United States in the early 1830s. Their express purpose was to pool the savings of local residents to finance the construction and purchase of homes. **Savings banks** predate the S&Ls by about 20 years and are located mostly on the East Coast of the United States. Sixty percent are in New York and Massachusetts. Like S&Ls, savings banks were founded to encourage thrift and to help finance the construction and purchase of homes.[8]

Although the assets of S&Ls are much larger than those of savings banks, we discuss S&Ls and savings banks together as savings associations because their assets and liabilities have a similar composition and because the institutions share other commonalities. The major sources of funds for savings associations are time, savings, and checkable deposits. In the aggregate, these deposits accounted for about 65 percent of total liabilities on September 30, 2008. As in commercial banks, most deposits are insured for up to $250,000. Savings associations were first allowed to issue negotiable orders of withdrawal (NOW) accounts (interest-earning checkable deposits) nationwide in 1980. Checkable deposits make up a growing source of funds for savings associations. They use the funds mainly to acquire mortgage loans, which comprised about 58 percent of total assets held on September 30, 2008. Treasury, agency, and government-sponsored enterprises securities made up about 16 percent of assets.

Although they still specialized in mortgage lending, savings associations diversified somewhat during the 1980s into various forms of lending that had previously been

prohibited by regulations. Other regulatory changes allowed the institutions to offer time deposits with rates that went up and down with rates on money market instruments, such as Treasury bills.

Prior to the 1980s, savings associations were not only prohibited from offering checkable deposits but also not allowed to pay rates on time and savings deposits that exceeded a ceiling rate set by regulators. In this earlier environment, small savings deposits were the major source of funds for savings associations. Small savers found passbook savings accounts attractive relative to the alternatives then available to them. The accounts were liquid, safe, insured stores of value with fixed interest rates. In the new environment, savings associations have more flexibility and now offer the public more diverse types of liabilities. As a result, there is more competition among banks, S&Ls, and savings banks to attract checkable and flexible rate time deposits.

During the 1980s, the S&L industry experienced multiple strains that came to be known as the *savings and loan crisis*. More than 500 institutions became insolvent and were seized by regulators during the late 1980s at the taxpayers' expense. The bailout also benefited taxpayers by maintaining the solvency of the financial system. The **Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) of 1989** attempted to resolve the crisis by creating a new federal regulatory structure, limiting the assets that S&Ls can acquire, and requiring S&Ls to maintain adequate capital. The final cost to the taxpayers for the bailout was approximately $124 billion, which was much less than initial estimates. (More on the S&L crisis in Chapter 16.) Although heavily committed to the mortgage market, savings banks were somewhat more judicious in their lending and consequently avoided some of the strains experienced by the S&Ls. Many savings and loans are again experiencing severe strains in the financial crisis of 2008. The collapse of Washington Mutual and buyout by J.P Morgan that was orchestrated by the Fed in September 2008 represented the largest failure of a depository institution in history.

Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) of 1989
An act that attempted to resolve the S&L crisis by creating a new regulatory structure, limiting the assets S&Ls can acquire, and requiring S&Ls to maintain adequate capital.

The changes in the structure of the assets and liabilities of savings associations over time suggest that FIs' areas of specialization are increasingly overlapping. Furthermore, recent legislation now allows banks and savings associations to merge. Reflecting this trend, the word *bank* is often used generically by the press and the public to refer to commercial banks, S&Ls, and savings banks.

Credit Unions

Credit unions cater almost exclusively to small savers and borrowers. They are cooperative, nonprofit, tax-exempt associations operated solely for the benefit of members. By law, members must share a "common bond" such as through an employer, a church, or a labor union. In 2003, the "common bond" rules were relaxed so that credit unions can get a "community charter" that allows a more widespread and diverse membership. Although there are about 11,500 credit unions, most are small in size; 60 percent have total assets of $10 million or less. As in other depository institutions, deposits may be insured for up to $100,000.

Credit Unions
Depository institutions that are cooperative, nonprofit, tax-exempt associations operated for the benefit of members who share a common bond.

Credit unions get most of their funds from members' savings accounts. In addition, as with S&Ls, regulatory changes first permitted credit unions to offer checkable deposits in 1980. Interest-earning checking accounts at credit unions are called *share drafts*, and they are now a significant liability for credit unions. As of September 30, 2008, about 30 percent of the assets held by credit unions were in the form of consumer loans to members, while about 42 percent were mortgages. Credit unions, which are tax-exempt, generally do not hold municipal securities.

The total funds acquired and loaned by credit unions have grown rapidly over the years. In 1970, for example, their assets totaled only $18 billion. The comparable late 2008 figure was $801.5 billion. Credit union assets increased almost fortyfold while prices increased a little more than fivefold! Being nonprofit institutions, credit unions have often offered depositors slightly higher rates and loan applicants slightly lower rates than have competing FIs. This advantage, along with the convenient locations of some credit unions (close proximity to businesses or the company cafeteria, for example), and the more recent relaxation of the "common bond" rules helps to explain their growth.

Recap The major sources of funds for commercial banks are checkable, savings, and time deposits, plus nondeposit liabilities. The major uses of funds by banks include loans, government securities, and reserves. Because of legislation passed in 1999, banks have also been authorized to underwrite and deal in municipal revenue bonds. For S&Ls, the major sources of funds are time, savings, and checkable deposits, while the major use of funds is to make mortgage loans. Credit unions are tax-exempt and small in size but numerous. Their main sources of funds are share drafts and small savings accounts. They primarily make small personal and mortgage loans to their members.

Contractual-Type FIs

Contractual-type FIs have liabilities that are defined by contract. These contracts call for regular payments to be made to the FIs in exchange for future payments under specified conditions. As mentioned earlier, these claims are often referred to as *contingent claims*. The major contractual types of FIs are life insurance companies, property and casualty insurance companies, public pension funds, and private pension funds.

Life Insurance Companies
Intermediaries that offer protection against the financial costs associated with events such as death and disability in exchange for premiums.

Life insurance companies offer the public protection against the financial costs, losses, and reductions in income associated with death, disability, old age, and various other health problems. Based on the principle of risk sharing, the public makes payments, generally called *premiums*, in exchange for this protection. The companies lend out the funds collected to other households, businesses, and governments who are net borrowers by purchasing their securities (loans, stocks, and bonds). The insurance companies use the interest and dividend income received from the securities purchased, along with the premiums, to pay benefits to policyholders as they come due. The influx of premium payments is relatively steady and predictable; statisticians (actuaries) can predict fairly well the proportion of policyholders likely to become disabled, die, or become ill in a given year, so life insurance companies have a reasonably predictable stream of benefit payments to policyholders distributed over time. This allows these institutions to use a fairly large portion of their funds to acquire longer-term assets. Longer-term instruments generally provide higher yields than shorter-term assets but are not as liquid. Given the nature of the companies' liabilities, holding a large portion of liquid assets is not as essential for them as it is for banks. For example, on September 30, 2008, about 39 percent of life insurance companies' assets were corporate and foreign bonds, about 25 percent were equities, and at least 14 percent were other long-term securities. Thus, over 78 percent of their assets were long term. The liabilities are the policy benefits (reserves) that are due and will be paid to policyholders in the future.

Pension Funds
Tax-exempt intermediaries set up to provide participants with income at retirement in exchange for premiums.

Pension funds are tax-exempt institutions set up to provide participants with retirement income that will supplement other sources of income, such as social security

benefits. Some pension plans are run by private corporations, and others are associated with federal, state, or local governments. In most cases, both employers and employees make contributions (pay premiums) to the pension fund. Like life insurance companies, pension funds have little need for a large amount of liquid assets. The number of people likely to retire each year is quite predictable. As a result, private pension funds and those associated with governments place a large percent of their funds—acquired through the contributions of employees and employers—into long-term assets. As of September 30, 2008, corporate equities, Treasury and agency securities, mutual funds, and corporate and foreign bonds (all long-term assets) made up over 75 percent of the assets of pension funds. Pension funds are the largest single class of investors in equities! The liabilities of pension funds are the policy benefits that will be paid out to policyholders in the future.

Property and Casualty Companies
Intermediaries that provide protection against the effects of unexpected occurrences on property.

Property and casualty companies provide protection against the untoward effects of unexpected occurrences on property, particularly automobiles and homes, in exchange for premiums. Two factors are relevant in trying to understand the composition of assets held by these FIs: (1) unlike pension funds, which are nontaxable, and life insurance companies, which are taxed at a very low rate, property and casualty companies are taxed at the full 38 percent corporate rate; and (2) compared to life insurance companies and pension funds, the stream of benefit payments made by these companies is less predictable. Accidents and natural disasters do not follow the more regular patterns of retirement and death. The Northridge, California, earthquake in 1994, Hurricane Opal in 1995, the attacks on the World Trade Center and the Pentagon on September 11, 2001, and Hurricane Katrina in 2005 account for some of the largest losses for property and casualty companies in history. Property and casualty companies need liquid assets to meet large and small exigencies. Tax considerations led these companies to hold over 28 percent of their assets in the form of tax-exempt municipal securities as of September 30, 2008. The need for liquidity helps to explain why over 7 percent of assets were held in the form of checkable deposits, currency, and repurchase agreements. The liabilities of property and casualty companies are the claims that will be paid out in the future.

Investment-Type FIs

The major types of intermediaries in the investment category are mutual funds, also known as *investment companies*, and money market mutual funds. Generally speaking, **mutual funds** acquire and pool funds from the public, invest the funds primarily in capital market instruments, and return the income received minus a management fee to the investors. Some funds invest in particular types of securities, such as corporate stocks and bonds, while others have broader asset portfolios that include stocks, bonds, mortgages, and so on. In the 1990s, mutual funds experienced tremendous growth. Small depositors poured money into mutual funds seeking higher returns than the low rates depository institutions were offering at the time. Mutual funds began expanding to offer other financial services previously provided by banks. Concern has been expressed regarding the adequacy of the regulation of mutual funds, given their tremendous growth in the 1990s (more on this in Chapter 20) and revelations of unethical and illegal trading by some mutual funds in the early 2000s. As of September 30, 2008, assets of mutual funds totaled $6,588.3 billion. The liabilities of mutual funds are the outstanding shares in the mutual fund.

Mutual Funds
Investment-type intermediaries that pool the funds of net lenders, purchase the long-term financial claims of net borrowers, and return the income received minus a fee to the net lenders.

Money Market Mutual Funds
Mutual funds that invest in money market instruments.

Money market mutual funds, mentioned briefly in Chapter 2, are mutual funds that limit the type of financial claims they purchase. They acquire funds from

individual investors and pool them to purchase money market instruments such as Treasury bills, bank CDs, and commercial paper. They do not invest in capital market instruments. The interest earned, minus a management fee, is then paid to investors. As of September 30, 2008, the assets of money market mutual funds were $3,376.5 billion. The liabilities of the money market mutual funds are the outstanding shares of the fund. Money market mutual funds came under severe stress in the financial crisis of 2007–2008. Nervous depositors were withdrawing funds from what were uninsured accounts. On September 19, 2008, the Treasury announced the creation of a plan that would insure money market mutual fund accounts for the next year, up to any account value. Money market mutual funds would pay a fee to participate in the insurance program.

Finance Company-Type FIs

Finance Companies
Intermediaries that lend funds to households to finance consumer purchases and to firms to finance inventories.

Finance companies such as Household Finance Corporation, Beneficial Finance, Commercial Credit Corporation, and the General Motors Acceptance Corporation lend funds to households to finance the purchase of consumer durables such as automobiles, appliances, and furniture or homes, and to businesses to finance inventories and the purchase or leasing of equipment. In the past, finance companies often loaned to borrowers considered risky by other types of FIs, particularly depository institutions. Today, finance companies lend to all types of borrowers. Their major sources of funds come from issuing long-term bonds (this source is by far the largest), selling commercial paper, and making bank loans. As of September 30, 2008, finance companies had assets of $1,910 billion, which were distributed somewhat equally among consumer credit, mortgages, and business loans.

Recap Contractual-type intermediaries offer contingency claims in return for regular payments. They include life insurance companies, property and casualty companies, and pension funds. Investment-type intermediaries (mutual funds and money market mutual funds) pool funds from the public, invest the funds, and return the income received, less a management fee, to the investors. Finance company-type intermediaries purchase mortgages, and lend to households to purchase consumer durables and to businesses to finance inventories.

PULLING THINGS TOGETHER

FIs can be classified into four groups:

1. Deposit types (banks, S&Ls, savings banks, and credit unions)
2. Contractual types (insurance companies and pension plans)
3. Investment types (mutual funds and money market mutual funds)
4. Finance company types

Exhibit 4-2 summarizes the major types of assets and liabilities of the various FIs. Exhibit 4-3 shows the value of the assets held by each FI.

As Exhibit 4-3 shows, contractual-type FIs are now by far the largest group of FIs in terms of total assets, while pension plans are the single largest type of contractual FI. Banks are the largest FIs, with pension plans second. Each group can be distinguished from other groups by the financial services they specialize in and the composition of their assets and liabilities. Such factors also help to distinguish one member of a group

4-2
Principal Assets and Liabilities of Financial Intermediaries

Type of Financial Intermediary	Primary Liabilities Sources of Funds	Primary Assets Uses of Funds
Depository Institutions		
Commercial Banks	Checkable, Savings, and Time Deposits	Loans, Mortgages, and Government Securities
Savings and Loan Associations	Checkable, Savings, and Time Deposits	Mortgages
Mutual Savings Banks	Checkable, Savings, and Time Deposits	Mortgages
Credit Unions	Checkable, Savings, and Time Deposits	Consumer Loans and Mortgages
Contractual Types		
Life Insurance Companies	Premiums	Corporate Bonds
Pension Funds	Employee and Employer Contributions	Stocks, Corporate Bonds, and Mortgages
Property and Casualty Insurance Companies	Premiums	Municipal and Corporate Bonds, and Government Securities
Investment Types		
Mutual Funds	Shares	Stocks and Bonds
Money Market Mutual Funds	Shares	Money Market Instruments
Finance Company Types		
Finance Companies	Bonds and Commercial Paper	Consumer and Business Loans, and Mortgages

from other members of the same group. More specifically, the composition of each FI's assets and liabilities depends mainly on (1) the range of financial services offered to the public; (2) any specialization in particular services offered to the public, perhaps as a result of custom; (3) the tax status of the institution; (4) the nature of the institution's liabilities; and (5) legal constraints or regulations governing the types of assets and liabilities that can be acquired.

Examples of these factors at work include the following:

1. S&Ls, reflecting custom and regulations, specialize in mortgage lending because they have a perceived competitive advantage and some tax advantages in that area.
2. Tax-exempt FIs, such as credit unions and pension funds, generally do not hold tax-exempt municipal securities, while institutions subject to the full corporate income tax, such as banks and property and casualty insurance companies, do hold such assets.
3. FIs such as life insurance companies that have a relatively steady and predictable inflow of funds and a fairly predictable stream of liabilities (payment outflows) hold more long-term and less-liquid assets than do FIs such as banks, which have a greater

4-3
Total Financial Assets of Principal FIs (in Billions of Dollars)

	1970	1980	1990	2000	2008[a]
Depository Institutions					
Commercial banks	$505	$1,481.7	$3,337.5	$6,468.7	$12,272.5[a]
Savings associations	252	792.4	1,323.0	1,217.7	1,518.5[a]
Credit unions	18	67.6	217.2	441.1	801.5[a]
Contractual Types					
Life insurance companies	201	464.2	1,351.4	3,135.7	4,798.0[a]
Property and casualty companies	50	182.1	533.5	862.0	1,337.3[a]
Pension funds	170	786.8	2,767.7	7,511.9	9,110.7[a]
Investment Types					
Mutual funds	47	69.7	661.3	4,576.5	6,588.3[a]
Money market mutual fund	—	76.4	493.3	1,812.1	3,376.5[a]
Finance Company Types	64	196.9	547.0	851.2	1,910.0[a]

a. As of September 30, 2008.
Sources: Figures for 1970 are from the *Annual Statistical Digest,* Federal Reserve Board, 1991, various pages. Figures for 1980, 1990, 2000, and 2006 are from the *Flow of Fund Accounts, Z1,* Board of Governors of the Federal Reserve System, various years.

need for liquidity because a considerable portion of their liabilities (deposits) are payable on demand.

4. Banks do not hold corporate equities because regulations prohibit it.

In addition, the nature of an FI's assets and liabilities determines the degree to which it must manage specific risks. For example, an FI with a high percentage of long-term fixed rate assets must manage interest rate risks to a greater degree than an FI whose assets and liabilities do not have such a maturity configuration. Likewise, an FI with uncertain payment contingencies must manage the liquidity risk to a greater degree than an FI whose payments are more certain and stable.

Together, regulations and customs, or long-established practices existing from the time particular types of FIs began operating, can account for some of the differences among FIs. Nevertheless, while such distinguishing characteristics should not be ignored, it is equally important to keep sight of the "common threads" that bind all types of FIs together. Moreover, as this chapter has suggested, FIs are currently undergoing fundamental changes.

Gramm-Leach-Bliley Act (GLBA)
Legislation that removed decades-old barriers between banking and other financial services by creating financial holding companies that linked commercial banks with securities firms, insurance firms, and merchant banks; it was passed by Congress in November 1999 and became effective March 2000.

At the risk of oversimplification, we can say that banks are increasingly entering the markets for financial services traditionally provided by other FIs, which are increasingly trying to enter the markets traditionally served by banks. This process of homogenization and the trend toward "financial supermarkets" mean that, as noted earlier, Sandi and Dave, whom we met at the beginning of the chapter (and the rest of us), no longer have to deal with five different types of FIs. One FI may provide the services previously supplied by many.

The trend toward financial supermarkets or conglomerates eroded the effectiveness of various regulations and thereby led to fundamental changes in regulations and traditional competitive positions. The tendency toward consolidation of financial services was given new impetus by the **Gramm-Leach-Bliley Act (GLBA),** which became

effective in March 2000. It removed decades-old barriers between banking and other financial services by creating *financial holding companies* that linked commercial banks with securities firms, insurance firms, and merchant banks. (More on the GLBA in Chapters 15 and 17.)

Even though banks and other intermediaries have experienced tremendous growth, they are losing ground to other nonfinancial institutions and direct financing venues, which have grown even faster. As previously mentioned, many corporate borrowers—both large and small—now borrow by issuing commercial paper rather than obtaining bank loans, and many nonfinancial corporations—Sears, AT&T, and General Motors, to name a few—now issue credit cards. In addition, more and more consumers bypass S&Ls to obtain mortgage loans directly from mortgage brokers.

Despite these ongoing developments, banks (and other depository institutions) probably are still the most important type of FIs because they have been central to the Fed's conduct of monetary policy and the determination of the money supply. We look at the Fed in the next chapter.

Summary of Major Points

1. In general, FIs are profit-seeking firms that link up net borrowers and net lenders and in the process provide the public a wide range of financial services. The linking or channeling function involves the acquisition of financial claims on borrowers by the FIs and the acquisition of claims on the FIs by lenders. FIs pool the surpluses of many net lenders and channel the funds to thousands of net borrowers. Risk is diversified because the net lenders are not putting all of their funds into one basket.
2. The quantity, quality, and type of financial services offered by FIs will vary with the perceived profitability of engaging in various activities.
3. FIs provide services to the public to reduce the risks and costs associated with borrowing and lending and other financial transactions. The claims on FIs are often more liquid and safer than claims on individual net borrowers would be. Some FIs also afford the public protection against the financial costs associated with various contingencies and fulfill the demand for various financial claims.
4. Most FIs are regulated. Historically, regulations tended to encourage specialization by certain types of FIs—in particular, financial services—and thus limited competition among different types of FIs. More recently, FIs have come to appreciate the benefits of diversifying and providing the public a wider range of financial services. This trend has led to various attempts to innovate around existing regulations, and competition has increased as a result. Recent legislation has allowed banks, insurance companies, and securities firms to affiliate under common ownership.
5. All FIs are exposed to various risks in varying degrees. Credit or default risk is the risk that a borrower will not live up to the terms of the liability it has sold. Asymmetric information is when a potential borrower knows more about the risks of an investment project than the lender. Adverse selection is when the least desirable borrowers pursue borrowing most diligently. Moral hazard is when the borrower has an incentive (the potential for higher profits) to use the borrowed funds for a more risky venture.
6. Interest rate risk is the risk that changes in the interest rate will turn a profitable spread into a loss. Liquidity risk is the risk that the FI will not have funds available to make required payments and will be unable to convert long-term assets to liquid funds quickly without a capital loss. Exchange rate risk is the risk that changes in exchange

rates will cause the FI to experience losses in the dollar value of foreign currency or foreign financial assets that the FI holds.

7. The differences among FIs manifest themselves in the financial services in which institutions specialize and in the composition of their assets and liabilities. The composition depends mainly on the range of financial services offered; any specialization in particular services, perhaps as a result of custom; the tax status of the institution; the nature of the FI's liabilities; and legal constraints or regulations.
8. The major types of FIs are deposit types, including banks, S&Ls, savings banks, and credit unions; contractual types, including insurance companies and pension plans; investment types, including mutual funds and money market mutual funds; and finance company types. The contractual-type group is the largest group, and commercial banks are the single largest FI.
9. The major sources of funds for commercial banks are checkable, savings, and time deposits, plus nondeposit liabilities such as fed funds, repurchase agreements, and Eurodollar borrowings. The major uses of funds for banks are loans, government securities, and reserves. The major sources of funds for S&Ls are time, savings, and checkable deposits. Their major use of funds is to make mortgage loans. Credit unions are tax-exempt, small in size, and numerous. Their main sources of funds are share drafts and small savings accounts. They primarily make small personal and mortgage loans to their members and invest in government securities. Savings banks, located mostly on the East Coast, lend heavily in the mortgage market.
10. Contractual-type intermediaries offer contingency claims in return for regular payments. They include life insurance companies, property and casualty companies, and pension funds. Life insurance companies and pension funds are able to invest in long-term assets because their payment outflows are relatively stable. Property and casualty companies must hold more liquid assets because they face more uncertainty with regard to their payment outflows. Investment-type intermediaries (mutual funds and money market mutual funds) pool funds from the public, invest the funds, and return the income received, less a management fee, to the investors. Mutual funds invest primarily in capital market instruments, including stocks and bonds. Money market mutual funds invest only in money market instruments. Finance company-type intermediaries lend to households to purchase consumer durables and homes, and to businesses to finance inventories.

Key Terms

Adverse Selection Problem, p. **72**
Asymmetric Information, p. **72**
Commercial Banks, p. **74**
Contingent Claims, p. **70**
Credit Unions, p. **77**
Default Risk, p. **71**
Diversification, p. **70**
Exchange Rate Risk, p. **73**
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Review Questions

1. List two services that FIs provide to the public. Why do intermediaries provide these services? What is a contingent financial claim? Give two examples.
2. "With financial intermediation, net lenders can earn a higher return on their surplus funds, and net borrowers can acquire funds at a lower cost." Explain how this seemingly contradictory statement can be true. (*Hint:* Consider a risk-free return.)
3. How are FIs like other firms? How are FIs similar to each other? How are they different?
4. If an FI has mainly long-term liabilities with few payment uncertainties, in what type of assets is it most likely to invest? Why?
5. What is a depository institution? What are the main types of depository institutions? What distinguishes them from other intermediaries?
6. Define default risk, asymmetric information, adverse selection, moral hazard, interest rate risk, liquidity risk, and exchange rate risk.
7. Identify the major contractual-type FIs. What are their main sources of funds (liabilities) and their main uses of funds (assets)?
8. What are the main sources of funds (liabilities) and uses of funds (assets) for finance company-type FIs?
9. Why does A-1 Student Auto Insurance Company need to hold more liquid assets than Senior Life Insurance Company? How do depository institutions manage liquidity risk?
10. John, a recent college graduate, is buying his first house. From which FIs could he obtain a mortgage loan?
11. How do money market mutual funds differ from mutual funds? How are money market mutual funds similar to depository institutions? As an investor, Sam holds both mutual funds and money market mutual funds. Holding which asset entails greater interest rate risk for him? Why?
12. Would a property and casualty company hold municipal securities in its portfolio of assets? What about a credit union and a life insurance company? Why or why not?
13. How can diversification reduce credit or default risk? In the event of widespread economic collapse, will diversification always reduce this risk?
14. What are the major determinants of an FI's liability structure? Give examples of each.
15. What was the purpose of the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) of 1989? Why was the act needed?
16. Which FIs have deposit insurance?
17. What is a mutual savings bank? (*Hint:* See Endnote 8.)

Analytical Questions

Questions marked with a check mark are (✓) objective in nature. They can be completed with a short answer or number.

18. Explain whether each of the following situations involves asymmetric information, adverse selection, or moral hazard:
    a. I am financing a new car. In applying for a loan, I withhold information about my student loan, and the loan does not show up on my credit report.
    b. Just before quitting my job, I take out all the credit cards I can. I plan to run them up to the limit and declare bankruptcy.
    c. I take out a loan to manufacture a product. My costs end up being higher than expected, and there seems to be little market for my product. I am unable to repay the loan.

✓19. If a bank has assets of $100 million and liabilities of $95 million, what is its net worth? If 60 percent of its assets were loans, what percentage of the loans could go sour before the bank would lose all of its capital?

✓20. What type of risk does each of the following situations portray?
    a. After the attack on the World Trade Center, several major insurance companies did not

have sufficient cash assets available to meet casualty claims.

b. ABC Bank, located along the U.S.–Mexican border, was holding a large quantity of Mexican pesos when the value of the peso collapsed.
c. Friendly S&L specializes in fixed rate mortgages. There is a sharp increase in short-term interest rates.
d. A family needs funds immediately to meet a medical emergency. All of its assets are tied up in real estate.
e. I am planning a trip to Europe next summer and have exactly $5,000. At the present exchange rates, I will have a great time. Is there any doubt?
f. Chad takes a loan for an expensive racing truck and then loses his job.

Suggested Readings

Banking statistics for the latest quarter can be viewed at **http://www.fdic.gov/bank/statistical/index.html.**

For an interesting discussion titled "Modern Risk Management and Banking Supervision," see the remarks by Chairman Ben S. Bernanke at the Stonier Graduate School of Banking, Washington, DC, June 12, 2006, available online at **http://www.federalreserve.gov/newsevents/speech/bernanke/20060612a.htm.**

For a look at the effect of low interest rates on FIs, see "How Low Interest Rates Impact Financial Institutions," by John V. Duca, *Southwest Economy*, Federal Reserve Bank of Dallas, 6 (November/December 2003): 8–12. This article is available online at **http://dallasfed.org/research/swe/2003/swe0306b.html.**

For a rather academic look at how some banking institutions compete, see William R. Emmons and Frank A. Schmid, "When For-Profits and Not-for-Profits Compete: Theory and Empirical Evidence from Retail Banking," Federal Reserve Bank of St. Louis, Working Papers, 2004–004A, February 2004. This article is available online at **http://research.stlouisfed.org/wp/2004/2004–004.pdf**.

For a look at some issues relating to pension funds, see Simon Kwan, "Underfunding of Private Pension Plans." *Economic Letter*, Number 2003–16, Federal Reserve Bank of San Francisco, June 13, 2003. It is available online at **http://www.frbsf.org/publications/economics/letter/2003/e12003–38.html.**

For a look at how some nonfinancial firms also engage in financial intermediation, see Mitchell Merlin, "Trade Credit: Why Do Production Firms Act as Financial Intermediaries?" *Business Review*, Federal Reserve Bank of Philadelphia (3rd Quarter, 2003): 21–28. This article is available online at **http://www.phil.frb.org/files/br/brq303mb.pdf**.

The Journal of Financial Intermediation has numerous articles that deal with material in this chapter. It is available online at **http://www.olin.wustl.edu/jfi/**.

Endnotes

1. Financial innovation will be affected by some of the regulatory changes in the financial system due to the financial crisis of 2008.
2. For the time being, we are ignoring the money creation process by depository institutions, which may also generate funds that are lent to net borrowers.
3. The exceptions, such as credit unions, will be discussed later in the chapter.
4. An FI can be exposed to losses if it has fixed rate liabilities, such as fixed rate CDs, and variable rate assets, such as variable rate loans. In this case, if interest rates fall, the return on assets falls, while the cost of liabilities does not.
5. To clarify, banks attract deposits (inputs) in order to make loans and other investments (outputs). Because banks hold reserve assets equal to only a fraction of their deposit liabilities when banks make loans, they create checkable deposits that are part of the money supply process.

6. To refresh your memory, money market deposit accounts are individual accounts authorized by Congress in 1982 that offer limited check writing (say, up to three checks per month) and generally pay higher interest than other checkable deposits.
7. Small depositors do not have to worry about the solvency of their bank as long as it is a member of the Federal Deposit Insurance Corporation (FDIC). Between 1980 and 2008, the deposits of all FDIC member banks were insured up to $100,000. In 2005, the limit on retirement accounts was increased to $250,000. In 2008, due to the ongoing financial crisis in the financial system, deposit insurance limits were temporarily increased to $250,000 on all accounts through the end of 2009.
8. The original savings banks were "mutuals," which meant that the depositors were really the owners of the institutions. They were actually benevolent philanthropic institutions set up to encourage the poor and the working class to save to relieve poverty and pauperism. The poor deposited whatever pennies they could, and the funds were managed by wealthy entrepreneurs. Today, roughly two-thirds of the savings banks retain this form of ownership, while one-third have sold stock and converted their ownership to stock savings banks.

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PART 2

Financial Prices

5 Interest Rates and Bond Prices

6 The Structure of Interest Rates

7 Market Efficiency and the Flow of Funds Among Sectors

8 How Exchange Rates Are Determined

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CHAPTER FIVE

5

Change must be measured from a known baseline.

—Evan Shute

Interest Rates and Bond Prices

Learning Objectives

After reading this chapter, you should know:

What compounding and discounting are

Why interest rates and bond prices are inversely related

The major determinants of interest rates

The relationship between nominal and real interest rates

How interest rates fluctuate over the business cycle

THE PRESENT VERSUS THE FUTURE

State University currently charges students $5,000 a year for tuition. Following the appointment of an innovative financial officer, it offers enrolling freshmen a new way to pay four years' tuition—pay $18,000 today rather than $5,000 per year for four years. Would you participate in the plan? Following her third box office smash, a Hollywood sensation has just signed a multipicture contract. As compensation, the star has been offered either $6,000,000 today or $7,500,000 in five years. You are her financial adviser; what should she do and why? You win a million-dollar lottery and learn that the million dollars will be paid out in equal installments of $50,000 per year over the next 20 years. Would you be willing to trade this stream of future income for one payment today? How large would that payment have to be?

The purpose of the first half of this chapter is to provide the analytical framework needed to understand questions that involve comparing the present with the future, such as those just posed. The questions addressed are the keys to the second half of the chapter, where we will examine the determinants of interest rates and the relationships among interest rates, bond prices, economic activity, and inflation.

THE TIME VALUE OF MONEY

Money represents purchasing power; a person who has money can purchase goods or services now. If someone does not have money now and wants to make purchases, she can rent purchasing power by borrowing. Likewise, if someone else has money now and is willing to postpone purchases to the future, he can rent out purchasing power. Note carefully the role played by the interest rate here. Presumably, the willingness to postpone purchases into the future is a function of the reward—that is, the interest rate. In particular, the higher the interest rate, ceteris paribus, the greater the reward and, hence, the greater the willingness to postpone purchases into the future and lend in the present. Similar reasoning applies on the borrowing side. We can think of someone who wants to purchase goods and services but is short of the necessary funds as having two options: (1) borrow now and purchase now or (2) save now and purchase later. Because the willingness to borrow depends on the cost, among other things, we can conclude that the higher the interest rate, ceteris paribus, the less attractive option (1) appears and the more attractive option (2) becomes.

The central point to remember from this discussion is the role that the interest rate plays in linking the present and the future. Lending in the present enables spending in the future the sum of what is lent plus the interest earned. Borrowing in the present enables spending in the present but requires paying back in the future what is borrowed plus interest. Because the interest rate is the return on lending and the cost of borrowing, it plays a pivotal role in spending, saving, borrowing, and lending decisions made in the present and bearing on the future. The concept is called the **time value of money.** Simply put, the interest rate represents the time value of money because it specifies the terms on which a person can trade off present purchasing power for future purchasing power.

Time Value of Money
The terms on which one can trade off present purchasing power for future purchasing power; the interest rate.

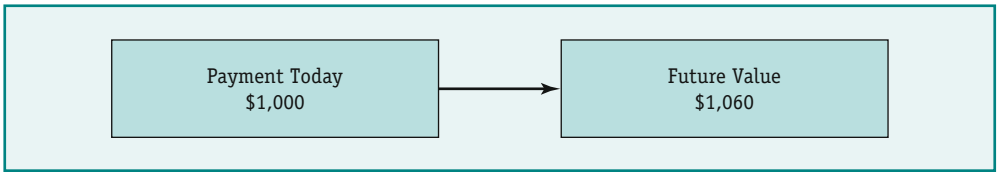
COMPOUNDING AND DISCOUNTING

Compounding: Future Values

Compounding is a method used to answer a simple question: What is the future value of money lent (or borrowed) today? As illustrated in Exhibit 5-1, the question is forward looking; we stand in the present (today) and ask a question about the future. To see how it works, a few examples will be helpful.

Compounding
A method used to determine the future value of a sum lent today.

5-1
Compounding: The Future Value of Money Lent Today



Principal
The original amount of funds lent.

Suppose Joseph M. Student agrees to lend a friend $1,000 for one year. The friend gives Joe an IOU for $1,000 and agrees to repay the $1,000 plus interest in a year. The amount that is originally lent is called the **principal**—in this case, $1,000.

If the agreed interest rate is 6 percent, the friend will pay a total of $1,060 ($1,000 + $60). In this example, the amount of interest is $60 ($1,000 × .06 = $60).

This general relationship can be expressed as:

(A) Amount repaid = principal + interest.
The amount of interest can be expressed as

(B) Interest = principal × interest rate.
Substituting Equation (B) into Equation (A) yields

(C) Amount repaid = principal + (principal × interest rate).
Because each term on the right-hand side of Equation (C) has a common factor, it can be rearranged and rewritten as

(D) Amount repaid = principal × (1 + *i*),
where i is the interest rate. Using Equation (D) and our example, Joe's friend would repay

$$\$1{,}060 = \$1{,}000 \times 1.06.$$

We can rewrite Equation (D) as

(5-1) $$V_1 = V_0(1 + i)$$

where V_1 = the funds to be received by the lender (paid by the borrower) at the end of year 1 (a future value); and V_0 = the funds lent and borrowed now (a present value).

Imagine now that Joe's friend borrows for two years instead of one year and makes no payments to Joe until two years pass.[1] Here is where compounding comes into play. Compounding refers to the increase in the value of funds that results from earning interest on interest. More specifically, interest earned after the first year is added to the original principal; the second year's interest calculation is based on this total. The funds to be received at the end of two years, V_2, consist of the original amount of funds lent out, V_0, ***plus*** the interest earned the first year on the original amount, $i\,V_0$, ***plus*** the interest earned the second year on the amount of funds owed at the end of the first year $[i(V_0 + iV_0)]$. In our example:

Principal	+	Interest earned in first year	+	Interest earned in second year =
$1,000	+	.06($1,000)	+	.06[$1,000 + .06($1,000)] =
$1,000	+	$60	+	$63.60 = $1,123.60

In the second year, Joe earns interest not only on the principal (.06 × $1,000) but also on the interest earned in the first year [.06 × .06($1,000)]. In effect, the interest earned in the first year is reinvested. Expressed symbolically:

(5-2) $$V_2 = V_0 + iV_0 + i(V_0 + iV_0)$$

Using some simple algebra, this equation can be reduced to[2]

$$V_2 = V_0(1+i)^2 \tag{5-3}$$

Equation (5-3) can be generalized for any sum of money lent (invested) for any maturity of n years:

$$V_n = V_0(1+i)^n \tag{5-4}$$

The future value of a sum of money invested for n years, V_n, is equal to the original sum, V_0, compounded by the interest rate $(1+i)^n$. In our last example, $V_0 = \$1{,}000$, $i = .06$, $n = 2$, and $V_2 = \$1{,}123.60$.

The formula in Equation (5-4) is actually quite easy to use. For example, most calculators have a y^x function, and $(1+i)^n$ is a y^x calculation. Using $(1+.11)$ for y and 10 for x, you should be able to verify that if Joe lends $1,000 for 10 years at an interest rate of 11 percent, he will receive $2,839.42 at maturity: $\$2{,}839.42 = \$1{,}000(1.11)^{10}$.

Discounting: Present Values

Discounting
A method used to determine the present value of a sum to be received in the future.

Present Value
The value today of funds to be received or paid on a future date.

In effect, as shown in Exhibit 5-2, **discounting** is backward looking. It addresses this question: What is the **present value** of money to be received (or paid) in the future?

Consider the case of the movie star mentioned at the beginning of the chapter. She has been signed to a multipicture deal, and the studio has offered to pay her either $6,000,000 today or $7,500,000 in five years. Which option should she select?

To calculate the answer, we can simply rearrange Equation (5-4). In the previous example, we knew the present value, V_0, the interest rate, i, and the number of years, n, and we wanted to solve for the future value, V_n. Now we want to solve for the present value, V_0, of a sum to be received in the future ($7,500,000), so we can compare it to another present value (the $6,000,000). Accordingly,

$$V_0 = V_n/(1+i)^n \tag{5-5}$$

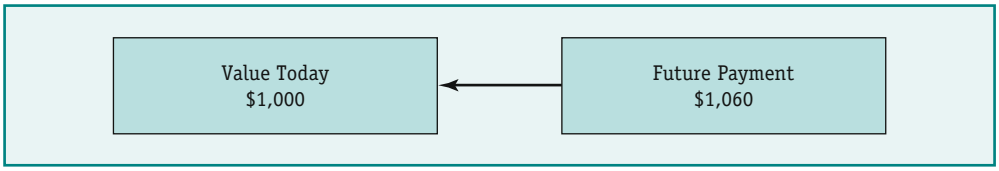
Assuming that we know the interest rate—say it's 6 percent—the present value of $7,500,000 to be available in five years is

$$\$5{,}604{,}436.30 = \$7{,}500{,}000/(1 + .06)^5.$$

The present value of $6,000,000 received today for signing the multipicture contract is, obviously, $6,000,000. Given an interest rate of 6 percent, the present value of $7,500,000 to be received in five years is obviously less.[3] Accordingly, the movie star should take the $6,000,000 today. To see why more clearly, all you need to do is turn the discounting/present value problem into a compounding/future value problem; if the actress took the $6,000,000 today and invested it at 6 percent, she would have more than $7,500,000 in five years. To be exact, she would have $8,029,353.47 because $6,000,000 $(1 + .06)^5 = \$8{,}029{,}353.47$!

To be sure you are completely with us, close the book and ask yourself what the present value of $7,500,000 in five years, given an interest rate of 6 percent, really represents. It is the sum you would need to invest today, given a 6 percent interest rate, to have $7,500,000 in five years; that is, to have $7,500,000 in five years given an interest rate of

5-2
Discounting: The Present Value of Money to Be Received in the Future



6 percent, you would have to invest $5,604,436.30 today. To nail everything down, assume the interest rate is 4 percent instead of 6 percent. Would you still advise the movie star to take the $6,000,000 today, or does the change in the interest rate point to a different option? Why or why not? The explanation and calculation are in endnote 4.[4]

Recap Compounding is finding the future value of a present sum. Discounting is finding the present value of a future sum. The future value, V_n, of a sum, V_0, invested today for n years is $V_0(1+i)^n$. The present value, V_0, of a sum, V_n, to be received in n years is $V_n/(1+i)^n$.

Interest Rates, Bond Prices, and Present Values

Par Value
The face value printed on a bond; the amount the bond originally sold for.

Coupon Payments
The periodic payments made to bondholders, which are equal to the principal times the coupon rate.

Although bonds issued by corporations and governments differ in a variety of ways, they generally share the following characteristics: they have an original maturity of more than 10 years, they have a face or **par value** (F) of $1,000 per bond, and the issuer (borrower) agrees to make equal periodic interest payments over the term to maturity of the instrument and to repay the face value at maturity. The periodic payments are called **coupon payments** (C) and are equal to the coupon rate on a bond multiplied by the face value of the bond. Note that the coupon rate, which usually appears on the bond itself, may not be the same thing as the current interest rate. The distinction between the coupon rate and the coupon payment and between the coupon rate and the interest rate is often a source of considerable confusion; bear with us and you can avoid the problem.

A bond represents a stream of future payments. Once the bond has been issued, the price the bond will trade at in secondary markets is the present value of the future stream of payments. To find its price, we need to compute the present value of each coupon payment and the present value of the final repayment of the face value on the maturity date. The appropriate formula is

$$(5\text{-}6) \qquad P = C_1/(1+i)^1 + C_2/(1+i)^2 + \cdots + C_n/(1+i)^n + F/(1+i)^n$$

where P = the price (present value) of the bond,
C = the coupon payment on the bond (C_1 in year 1, C_2 in year 2, etc.),
F = the face or par value of the bond,
i = the interest rate, and
n = the number of years to maturity (on a five-year bond, n = 5).

Notice that this formula is a descendant of Equation (5-5), with $P = V_0$ and $V_n = C$ or F. The only difference is that we use (5-6) to compute the present value of a number of future payments, such as occurs with a bond, and (5-5) to compute the present value of a single future payment. Suppose Jane is about to buy a bond that will mature in one year, has a face value of $1,000, and carries a coupon payment of $60, and the prevailing interest rate in the market is 6 percent. What is Jane willing to pay for this bond? Using Equation (5-6),

$$P = \$60/(1+.06)^1 + \$1{,}000/(1+.06)^1 = \$56.60 + \$943.40 = \$1{,}000.$$

This tells Jane that the price of the bond or its present value is $1,000.[5] In other words, if the interest rate is 6 percent, the present value of receiving $1,060 in one year is $1,000, and this is what Jane (or anybody else) will pay for the bond. Because the coupon payment is $60, the coupon rate is 6 percent (6 percent = $60/$1,000). You might also note that when the price of a bond is equal to its par value ($1,000), the coupon rate is equal to the current interest rate.

Continuing with this example, Jane buys the bond for $1,000, and the next day the prevailing interest rate in the market rises to 8 percent. What effect does this have on

the value (price) of Jane's bond? Remember that Jane's bond will pay her $1,060 in one year.[6] Imagine yourself with $1,000 to invest. How much would you pay for Jane's bond? Would you pay $1,000? We hope your answer is "no!" You could go out in the market and buy another bond yielding 8 percent for $1,000! Alternatively, you could buy Jane's bond. But you would do this if and only if it too was somehow made to yield 8 percent. How could this happen? The maturity of the bond (one year), the coupon payment ($60 per $1,000 of par value), and the par value ($1,000) are all fixed. They represent the contractual arrangements entered into by the bond issuer (borrower) at the time the bond was initially issued. What's left? The price of the bond! You and other investors would be willing to pay a price for the bond that, given the receipt of $1,060 at maturity, would represent a yield over the year of 8 percent. Using our Equation (5-5),

$$P = \$60/(1 + .08)^1 + \$1{,}000/(1 + .08)^1 = \$55.55 + \$925.93 = \$981.48.$$

The amount $981.48 is the present value of $1,060 to be received in one year if the interest rate we use to discount the future sum is 8 percent.

Put somewhat more intuitively, if you bought Jane's bond for $981.48, you would receive $60 of interest at maturity plus a capital gain of $18.52; the gain is equal to the par value you get back at maturity ($1,000) minus the price you pay at the time of purchase ($981.48). Together, the interest and the capital gain ($60+$18.52 = $78.52) give us an 8 percent yield over the year ($78.52/$981.48 = .08). Thus, in this example, you buy the bond at a price below its par value. This is called a **discount from par** and raises the yield on the bond, called the **yield to maturity,** from 6 percent to 8 percent. In sum, as the market interest rate rises, the price of existing bonds falls. The lower yield to maturity on existing bonds is unattractive to potential purchasers who can purchase newly issued bonds with higher yields to maturity. Therefore, the yield to maturity on previously issued bonds must somehow rise to remain competitive with the new higher level of prevailing interest rates. The yield on existing bonds rises when their prices fall. Hence, bond prices fall until the yield to maturity of the bond becomes equal to the current interest rate.

Discount from Par
When a bond sells below its face value because interest rates have increased since the bond was originally issued.

Yield to Maturity
The return on a bond held to maturity, which includes both the interest return and any capital gain or loss.

Suppose that instead of rising from 6 percent to 8 percent the day after Jane buys the bond, the interest rate in the market falls to 4 percent. You should now be able to do the arithmetic with the aid of Equation (5-6); the price (or present value) of Jane's bond will rise to $1,019.23. What does this represent? If any of us bought Jane's bond for $1,019.23, we would be paying a price above the par value. This is called a **premium above par.** At maturity, we would get $60 minus a capital loss of $19.23; the loss is equal to what we pay at the time of purchase minus the par value we receive at maturity ($1,019.23–$1,000 = $19.23). The $40.77 ($60–$19.23 = $40.77) represents a 4 percent yield over the year ($40.77/$1,019.23 = .04). Thus, as the market interest rate falls, the prices of existing bonds rise. The reason is that the higher yield to maturity on existing bonds is attractive to potential investors, and as they buy existing bonds, the bond prices rise, reducing their yield to maturity.

Premium above Par
When a bond sells above its face value because interest rates have decreased since the bond was originally issued.

In general, then, there is an inverse relationship between the price of outstanding bonds trading in the secondary market and the prevailing level of market interest rates. As a result, we can say that if bond prices are rising, then interest rates are falling, and vice versa. One final point: for any given change in interest rates, the longer the term to maturity, the greater will be the change in the price of the bond. Thus, the prices of bonds that are going to mature in the very near future fluctuate much less than prices of longer term bonds. For example, if interest rates rise, the prices of bonds that are very close to maturity will not fall that much because the proceeds can shortly be reinvested at the new higher rates. This is not so for longer term bonds.

Fluctuations in Interest Rates and Managing a Bond Portfolio

Why would the manager of a bond portfolio for a large pension fund be concerned about the likely direction of interest rates? Simply put, if rates rise sharply, for example, the value of the manager's portfolio, which contains previously purchased bonds, would fall significantly. This year's bonus for skillful management could go right out the window. Conversely, if rates fall, the prices of previously purchased bonds increase, and capital gains are in the offing. Such possibilities are what motivate managers and their advisers to pay so much attention to the factors that determine interest rates. More specifically, a portfolio manager who believes the Fed is about to engage in actions that will raise interest rates is likely to sell a considerable amount of bonds now to avoid the capital losses on bonds held that will accompany any rise in market yields. Conversely, the expectation of a fall in interest rates would encourage purchases of bonds now in anticipation of the capital gains that will accompany such a fall.[7]

Positioning the pension fund to take advantage of any change in interest rates requires our portfolio manager to understand the major factors determining movements in interest rates. Note that it is the expectation of interest rate changes that motivates the portfolio manager into action. After interest rates have changed, it is too late to take advantage of potential capital gains or to avoid potential losses. Of course, it is not too late to try to avoid making the same mistake again and again.

Recap

The price of a bond is the discounted value of the future stream of income over the life of the bond. When the interest rate increases, the prices of previously issued bonds decrease. When the interest rate decreases, the prices of previously issued bonds increase.

THE DETERMINANTS OF INTEREST RATES

In previous chapters, we emphasized the role of the financial system in coordinating and channeling the flow of funds from net lenders to net borrowers. The interest rate is of paramount importance because changes in the interest rate affect the amount of lending and borrowing, and vice versa. In the market for loanable funds, as in other markets, supply and demand represent the key to determining interest rates. This means, of course, that any change in interest rates will be the result of changes in supply and/or demand for loanable funds.

Demand for Loanable Funds
The demand for borrowed funds by household, business, government, or foreign net borrowers.

The **demand for loanable funds** originates from household, business, government, and foreign net borrowers who borrow because they are spending more than their current income. The downward-sloping demand curve indicates that net borrowers are willing to borrow more at lower interest rates, ceteris paribus.[8] Businesses borrow more at lower interest rates because more investment projects become profitable, ceteris paribus. Projects that would be unprofitable if the business had to pay 12 percent to borrow the funds become quite profitable if the funds can be had for only 2 percent. Consumers borrow more at lower interest rates, ceteris paribus, for such things as automobiles and other consumer durables.

Supply of Loanable Funds
The supply of borrowed funds originating (1) from household, business, government, and foreign net lenders or (2) from the Fed through its provision of reserves.

The total **supply of loanable funds** originates from two sources: (1) household, business, government, and foreign net lenders who are prepared to lend because they are spending less than their current income, and (2) the Fed, which, in its ongoing attempts to manage the economy's performance, supplies reserves to the financial system that lead to increases in the growth rate of money (and loans). We shall assume that the Fed's

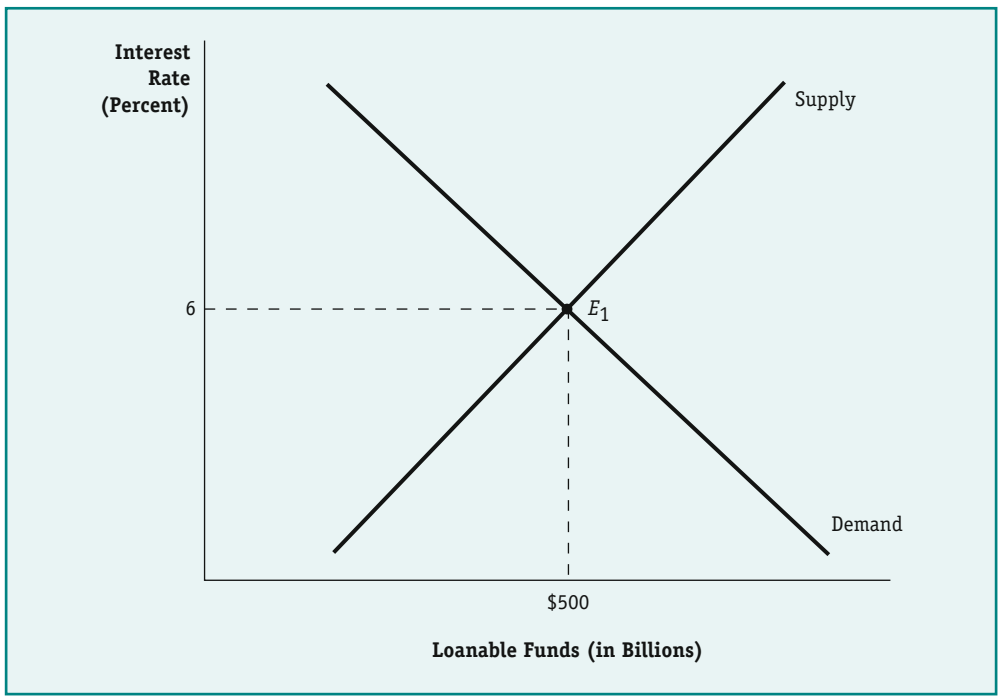
supply of funds is fixed at a particular amount for the time being. Adding the funds that net lenders are willing to supply to the Fed's supply of funds produces a supply curve for loanable funds that is upward sloping.

To illustrate how the behaviors of the Fed and net lenders interact, suppose that during the current period the Fed supplies reserves to the financial system leading to $300 billion of loanable funds being supplied to the market, and that this amount of funds will not increase or decrease as the interest rate changes. As for net lenders, suppose they are willing to lend $100 billion at a 4 percent interest rate, $200 billion at a 6 percent interest rate, and $300 billion at an 8 percent interest rate. Adding the fixed supply of loanable funds resulting from the Fed's supply of reserves to the interest-sensitive amount that will be supplied by net lenders, we get the total supply of funds of $400 billion at a 4 percent rate, $500 billion at a 6 percent rate, and $600 billion at an 8 percent rate. This is how the supply function shown in Exhibit 5-3 is calculated. Note that its upward slope reflects the changes in the quantity of funds supplied by net lenders at different interest rates, everything else remaining unchanged.

This indicates that net lenders are willing to supply more funds at higher interest rates because lending would be more profitable, ceteris paribus. As Exhibit 5-3 shows, the quantity of funds supplied equals the quantity of funds demanded at point E_1. The equilibrium interest rate in the market for loanable funds is 6 percent, and the equilibrium quantity of funds borrowed and lent is $500 billion.

From the point of view of our portfolio manager, it is not sufficient to know the equilibrium or current interest rate. What is really of concern is the potential for future changes in interest rates and the capital gains (increases in bond prices) or capital losses (decreases in bond prices) that will accompany such changes. Because any change in in-

5-3
The Supply of and Demand for Funds



The interest rate is measured on the vertical axis, and the quantity of loanable funds is measured on the horizontal axis. At E_1, the quantity demanded is equal to the quantity supplied and the market is in equilibrium. The supply of and demand for loanable funds determine the interest rate.

terest rates will be the result of a change in either the supply of or demand for funds, let's take a close look at the major factors that can shift either of the curves.

Changes in the Demand for Loanable Funds

Gross domestic product (GDP) is the dollar value of final goods and services produced in the domestic economy in a year.[9] On the demand side, research has shown that movements in GDP represent a major determinant of shifts in the demand for funds. In particular, when GDP rises, ceteris paribus, firms and households both become more willing and able to borrow. Firms are more willing because the rise in GDP has improved the business outlook, encouraging them to expand planned inventories and engage in more investment spending such as purchases of plant and equipment. These new activities will have to be financed by borrowing. Households are more willing to borrow because the rise in GDP has increased their incomes and improved the employment outlook. These factors encourage them to increase their purchases of goods and services, particularly automobiles, other durable goods, and houses, which often require some financing. Firms and households are more able to borrow because the improved economic outlook and the rise in incomes will make it easier to make the payments on any new debt.

A positive relationship between changes in income and the demand for loanable funds means that both move in the same direction—when one rises, the other rises, and vice versa. Some students are puzzled by the positive relationship between GDP (income) and the demand for funds. They argue that these variables should be negatively related; for example, a drop in income, given expenditures, will increase a household's deficit, necessitating a rise in the demand for funds (borrowing). The problem with this reasoning is that expenditures are assumed to remain constant. In fact, the drop in income will lead to a reduction in expenditures. More generally, historical experience shows that the willingness and ability to borrow and spend will fall when income falls.

Another factor that affects the demand for loanable funds is an increase in the anticipated productivity of capital investments. Anticipated increases in productivity lead to a greater demand for capital investment and, hence, increase the demand for loanable funds.

The effect of an increase in the demand for funds resulting from a rise in income or an anticipated increase in the productivity of capital investment is shown in Exhibit 5-4. The demand for funds shifts from *DD* to *D'D'*. Previously, the quantity of funds supplied was equal to the quantity of funds demanded at point E_1; the equilibrium interest rate prevailing in the market was 6 percent, and the quantity of funds borrowed and lent was $500 billion. When the demand curve shifts to the right, ceteris paribus, a disequilibrium develops in the market. More specifically, at the prevailing 6 percent rate, the quantity of funds demanded exceeds the quantity supplied. Given this excess demand, the interest rate rises. The higher interest rate induces net lenders to increase the quantity of loanable funds they are willing to supply (a movement along the supply curve). Such changes in plans help to close the gap between quantity demanded and quantity supplied, and a new equilibrium is eventually established at point E_2, where the interest rate is 8 percent and the quantity of funds borrowed and lent is $600 billion. To sum up, we start with an equilibrium; demand increases, ceteris paribus, creating a disequilibrium; the interest rate goes up, and a new equilibrium is established.

Changes in the Supply of Funds

On the supply side, as you already know, one of the factors determining the supply of loanable funds is monetary policy. In particular, the Fed's ability to alter the growth rate of money in the economy means that it has a direct effect on the cost and availability of funds. To illustrate, a Fed-engineered increase in the supply of funds, as shown in

5-4
A Shift in the Demand for Funds

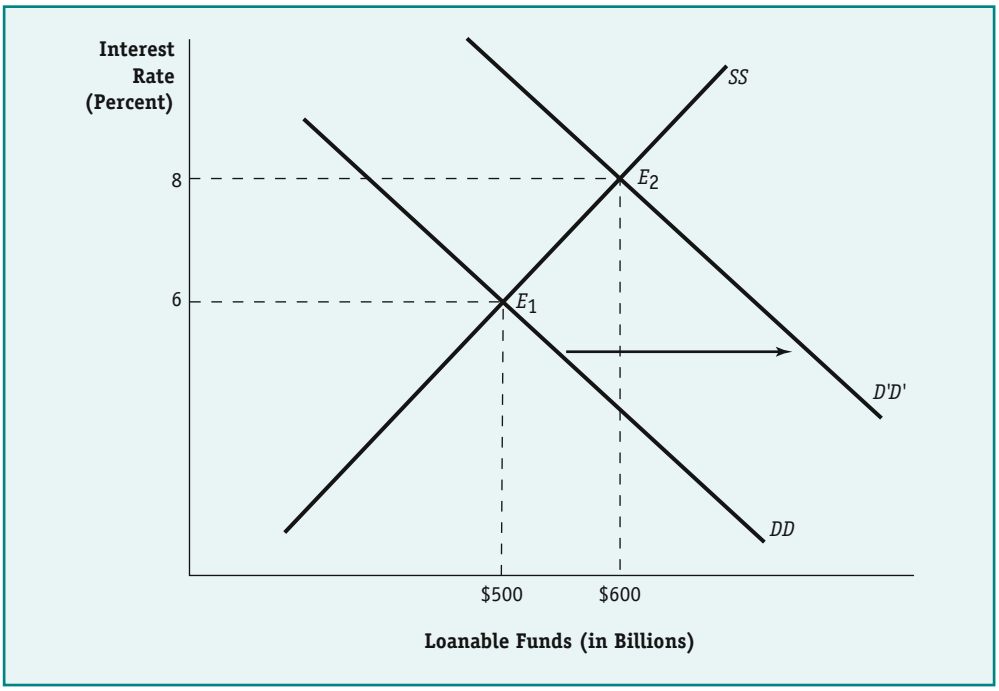


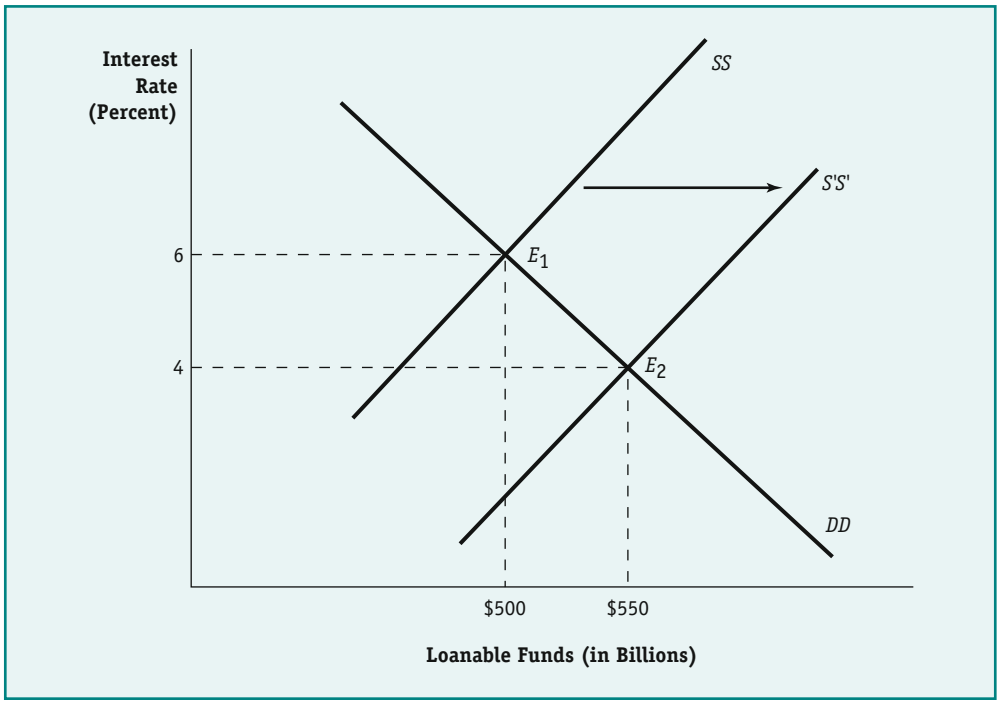
Exhibit 5-5, shifts the supply curve from *SS* to *S'S'*, ceteris paribus. This creates a disequilibrium: The quantity supplied of funds exceeds the quantity demanded of funds at the prevailing 6 percent interest rate. The excess quantity supplied puts downward pressure on interest rates. As interest rates fall, net borrowers and net lenders revise their borrowing and lending plans. For example, as the cost of borrowing falls, net borrowers will be induced to borrow a larger quantity (a movement along a demand curve). Such actions, which serve to narrow the gap between quantity supplied and quantity demanded, will continue until a new equilibrium is established at point E_2. The result is a fall in the interest rate from 6 percent to 4 percent and an increase in the quantity demanded from $500 billion to $550 billion. In sum, the money supply growth rate and the interest rate are inversely related, ceteris paribus. Holding other things constant, an increase in the money supply will lower the interest rate, and a decrease in the money supply will raise the interest rate via the effect of changes in the growth rate of the money supply on the supply of loanable funds.[10]

Another way to see this is to visualize financial intermediaries in the economy, particularly depository institutions, as having more funds to lend as a result of the Fed taking action to increase the money supply. The intermediaries will use these funds to acquire interest-earning assets such as securities and loans. If they demand more securities (bonds), this will raise the price of bonds and lower the interest rate on newly issued bonds and the yield to maturity on outstanding bonds, ceteris paribus. If the intermediaries want to extend loans, they will have to induce households and firms to borrow more than they are currently borrowing or planning to borrow. How can this be accomplished? If you said, "Lower the rates charged on loans," you are correct. Thus, the movement from E_1 to E_2 in Exhibit 5-5 is in response to a series of transactions, including the acquisition of securities, extension of loans, and accompanying changes in interest rates, that are at the heart of the operations of the financial system and its role in the economy.

The discussion of the determinants of interest rates, at least up to this point, can be summarized in a fashion that will prove quite convenient later on:

$$i = f(\overset{+}{Y}, \overset{-}{M}) \qquad (5\text{-}7)$$

5-5
A Shift in the Supply of Funds



Equation (5-7), which is really a sentence written in shorthand, says the interest rate (i) is a positive function of income or GDP, Y, and a negative function of the money supply, M, ceteris paribus.[11] From the preceding discussion and accompanying graphical analysis, you should know that a rise in Y, holding other factors like M constant, will raise the demand for funds and, thus, the interest rate. Likewise, a rise in M, holding other factors like Y constant, will increase the supply of loanable funds and thus decrease the interest rate.

Of course, in the real world, other factors are not constant. Why is this important to keep in mind? Imagine that data released by the Fed indicate that both M and i are increasing. What could explain this seemingly paradoxical result? The answer is that the demand for funds must have increased by more than the increase in supply. This could result from an increase in income or, as you will learn in the next section, from an increase in expected inflation. We suggest graphing this case and others like it to make sure you understand the way in which Y, M, and i interact.

In Chapter 2, we saw that the interest rate could also be determined by the demand and supply of money. In reality, money is a stock variable that is measured at a point in time. Our model here deals with flows of loanable funds over time. Now would be a good time to read "A Closer Look" on p. 103, as it reconciles the two theories.

Recap

The demand for loanable funds originates from net borrowers. The quantity demanded is inversely related to the interest rate, ceteris paribus. The supply of loanable funds originates from net lenders and from the Fed, which supplies reserves to the banking system. The quantity supplied is directly related to the interest rate, ceteris paribus. If incomes increase, the demand for loanable funds increases and the interest rate rises. Likewise, if the anticipated productivity of capital investment increases, the demand for loanable funds increases. If the money supply increases, the supply of loanable funds increases and the interest rate falls:

$$i = f(\overset{+}{Y}, \bar{M})$$

INFLATION AND INTEREST RATES

If you lend a friend $100 today and she agrees to pay it back in one year with 5 percent interest ($100×.05=$5), you may consider yourself $5 richer and a shrewd financier. Your $100 will earn $5 of interest income for you. However, if during the year the inflation rate is 5 percent, the real value—purchasing power—of the funds lent plus interest will be exactly the same as the real value of your funds at the beginning of the year. As a result, your real reward for lending would be zero. In fact, if the inflation rate is higher than 5 percent, your friend would be paying you back an amount of money one year from now that would buy fewer goods and services than the amount you lent would buy today. Your real reward would be negative. The shrewd financier in this case would be your friend, not you! You might, of course, still engage in this transaction if it is your absolute best opportunity. If you hold idle cash or money in a checking account earning low interest, you would lose even more in real terms. However, we hope you would be able to find a savings opportunity that paid you a positive real (inflation-adjusted) return.

This example suggests that lenders are concerned about two things: (1) nominal interest, or how many dollars they will receive in the future in return for lending now; and (2) inflation, or the real purchasing power the funds will be worth upon repayment. For instance, a bond bearing even a relatively high interest rate may not be attractive to lenders if, due to price inflation, the money later repaid has less purchasing power than the money originally lent.

Nominal Interest Rate
The market interest rate, or the real return plus the rate of inflation expected to prevail over the life of the asset.

Real Interest Rate
The interest rate corrected for changes in the purchasing power of money.

Money Illusion
When spending units react to nominal changes caused by changes in prices, even though real variables such as interest rates have not changed.

The implication of all this is that the market interest rate—called the **nominal interest rate**—is not an adequate measure of the real return on an interest-bearing financial asset unless there is assurance of price stability. Rather, the appropriate measure is the **real interest rate,** which is the return on the asset corrected for changes in the purchasing power of money. The real interest rate is the nominal interest rate minus the rate of inflation expected to prevail over the life of the asset. For example, if an investor expects inflation of 4 percent, an asset bearing 7 percent nominal interest will be expected to yield only approximately 3 percent in real terms. If inflation of 7 percent is expected, the investor would expect the asset bearing 7 percent nominal interest to yield nothing in real terms.

Money illusion occurs when investors react to nominal changes (caused by inflation) even though no changes in real interest rates have occurred. Financial investors who are not victims of money illusion will try to find an investment that pays the highest real return. Wise investors will concern themselves with the nominal market interest rate only insofar as it enters into their calculation of the real interest rate, which is the correct measure of the reward for lending and the cost of borrowing.

The above discussion can be summarized by some simple definitions written in the form of identities that are true by definition:

$$i = r + p^e \tag{5-8}$$

Inflation Premium
The amount of nominal interest added to the real interest rate to compensate the lender for the expected loss in purchasing power that will accompany any inflation.

Equation (5-8) says that the nominal interest rate has two parts: a real interest rate, r, and an inflation premium. The **inflation premium** is the amount of nominal interest that will compensate a lender for the expected loss of purchasing power accompanying any inflation. Accordingly, the inflation premium is equal to the expected inflation rate, p^e, and therefore, nominal interest rates rise or fall as expected inflation rises or falls, ceteris paribus. Rearranging Equation (5-8) produces

$$r = i - p^e \tag{5-9}$$

One of the first economists to statistically analyze the relationship between inflation and nominal interest rates was Irving Fisher, a prominent economist of the early

Interest Rates: Which Theory Is Correct? Reconciling Stocks and Flows

Liquidity preference is the name given to the theory based on the demand for and supply of money. It was developed by John Maynard Keynes in the 1930s. The supply of money is the stock of money, and the demand for money, or "preference for liquidity," is how much money spending units wish to hold. The supply of and demand for money are both measured at a point in time and refer to actual *stocks*. The stock of money is partially determined by the central bank through its control over the stock of reserves and reserve requirements. Also, remember from Chapter 2 that the demand for money is based on the spending plans of spending units. Demand is positively related to income, and quantity demanded is negatively or inversely related to the interest rate, ceteris paribus. The interest rate adjusts to equate the quantity supplied (stock) of money with the quantity demanded.

The loanable funds theory developed in this chapter is based on *flows* as opposed to stocks. Flows are measured through time, whereas stocks are measured at a point in time. Thus, if I offer you a job for $10,000, you will want to know whether this is per week, per month, or per year. Not so for stocks. If I give you a $10,000 savings account, there is no relevant time dimension. The loanable funds theory develops the argument that the interest rate is determined by the supply of and demand for loanable funds. The demand for loanable funds reflects borrowing plans by net borrowers, while the supply of loanable funds reflects lending plans by net lenders. Ceteris paribus, the quantity demanded of loanable funds is inversely related to the interest rate, while the quantity supplied of loanable funds is directly related to the interest rate. The interest rate adjusts to equate the quantity demanded of loanable funds with the quantity supplied.

To help you see that the theories complement each other, consider what happens when the Fed increases bank reserves. When reserves increase, banks create money by incurring deposit liabilities as they acquire loans as assets. In doing so, banks have simultaneously augmented the supply of loanable funds. According to liquidity preference, an increase in the supply of money, ceteris paribus, causes the interest rate to fall, while according to the loanable funds theory, an increase in the supply of loanable funds has the same effect. Likewise, if the Fed decreases the supply of reserves, you should be able to verify that both the stock of money and the supply of loanable funds decrease, leading to a higher interest rate. Again both theories predict that the interest rate changes in the same direction.

Next consider what happens when the demand for loanable funds increases, reflecting an increased desire by people to borrow more at every interest rate. Because banks acquire loan assets when they create checkable deposits, which are also money, an increase in the demand for loanable funds corresponds to an increase in the demand for money. According to both theories, an increase in the interest rate results. Likewise, a decrease in the demand for loanable funds translates to a decrease in the demand for money and a lower interest rate.

From an intuitive standpoint, we can reconcile the two theories by recognizing that when there is a change in a stock measured at different times, a flow has

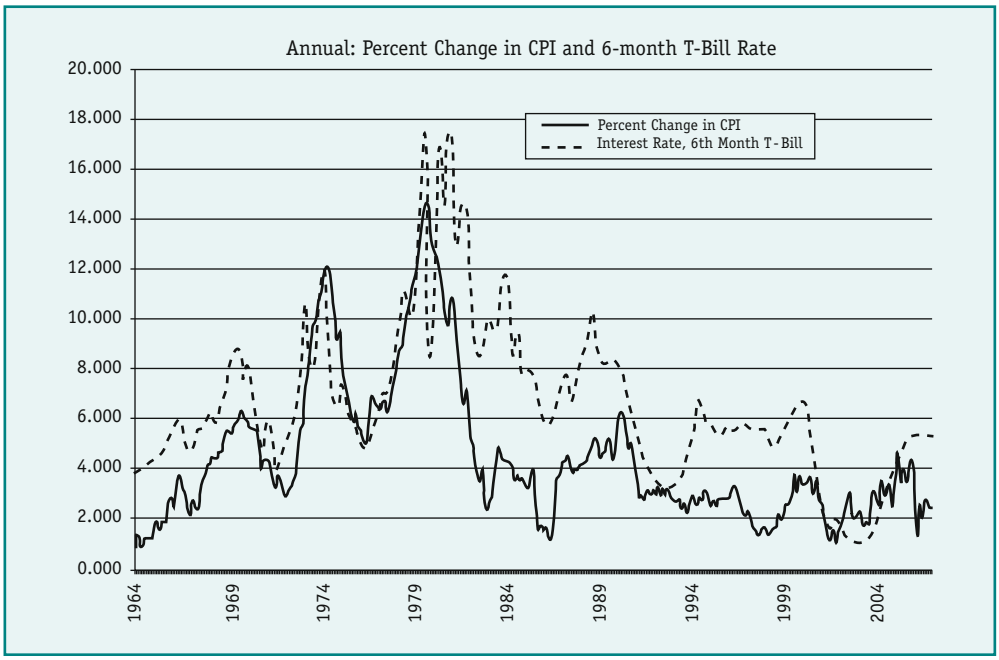
occurred; that is, a flow over time results in a change in a stock. For example, if I have a gallon of milk in the morning, go to the refrigerator for a glass of milk repeatedly throughout the day, and have half a gallon left at the end of the day, then I can safely say that I consumed half a gallon of milk during the day. Consumption of milk over the course of the day represents a *flow,* but the amount of milk in the refrigerator at a point in time is a *stock.* The change in the stock of milk as measured at two different points in time depicts the flow. If I save $100 per year, at the end of the year my stock of wealth will have increased by $100 (ignoring interest payments for the time being). Correspondingly, changes in the supply (flow) of loanable funds entail changes in the stock of money as measured at two different points in time. Likewise, changes in the demand (flow) of loanable funds entail changes in the demand for money. A theory stated in flows can always be reformulated in terms of stocks and vice versa.

twentieth century. The available evidence, such as that shown in Exhibit 5-6, does show that nominal interest rates are highly correlated with inflation and inflationary expectations.

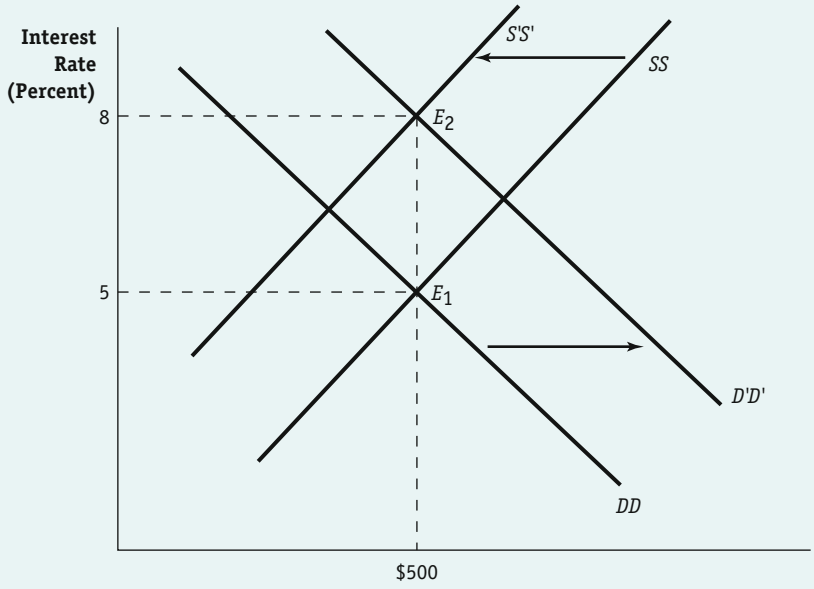
Now suppose the commercial paper rate is 5 percent and the current and expected rate of inflation is 3 percent. This means that the expected real interest rate is 2 percent. What happens if borrowers and lenders revise their expectation of future inflation upward to 6 percent? If the commercial paper rate remains at 5 percent, they will expect the real interest rate to be minus 1 percent. This is the real cost of borrowing funds. The fall in the expected real cost of borrowing will produce a rise in the nominal demand for funds. The rise in demand should, in turn, put upward pressure on the nominal commercial paper rate.

What about lenders of funds in the commercial paper market? Initially, they would have expected a real return of 2 percent (.05 – .03 = .02). If the lenders also revise

5-6
Inflation and the Interest Rate, 1964–2008



5-7
Inflation and Interest Rates: A Graphical Treatment



We begin, as in Exhibits 5-3, 5-4, and 5-5, with an initial equilibrium at point E_1 and a prevailing interest rate of 5 percent. If the expected inflation rate, p^e, is 3 percent, this nominal rate, i, implies a real rate, r, of 2 percent ($i = r + p^e$ or 5 percent = 2 percent + 3 percent). Assume now that p^e rises to 6 percent, ceteris paribus. At a 5 percent nominal rate, lenders will now expect a lower real rate (–1 percent instead of +2 percent). Accordingly, they will be willing to lend less, shifting *SS* to *S'S'*. As for the borrowers, the rise in p^e means that the expected real cost of borrowing at a 5 percent nominal rate has fallen (from +2 percent to –1 percent). In response, they will want to borrow more, shifting *DD* to *D'D'*. The eventual result of the fall in supply and rise in demand is an increase in the nominal rate equal to the change in inflationary expectations.

their expectations of inflation upward to 6 percent, it seems reasonable to presume that an expected real return of minus 1 percent would make them less willing to lend and would thus reduce the nominal supply of funds available in the commercial paper market. The reduction in supply would also put upward pressure on the nominal commercial paper rate.

The combined effect of the increase in demand and reduction in supply, as shown in Exhibit 5-7, is a rise in the interest rate from 5 to 8 percent. With expected inflation rising from 3 to 6 percent, the inflation premium and, therefore, the nominal interest rate rises by 3 percent, from 5 to 8 percent. In this example, the increase in the interest rate is equal to the increase in inflationary expectations. In an imperfect world—the real world—this may not always be the case, but we can be pretty certain that the direction of the change in interest rates will match the direction of the change in inflationary expectations.

In sum, expectations of inflation affect portfolio choices that help determine the demand and supply of loanable funds. Because interest rates respond to changes in demand and supply, and expectations of inflation affect demand and supply, we can conclude that expectations of inflation affect interest rates. Given this relationship, we can rewrite Equation (5-7) as follows:

$$i = f(\overset{+}{Y}, \overset{-}{M}, \overset{+}{p^e}) \qquad (5\text{-}10)$$

Cracking the Code

Calculating the Inflation Rate

Consumer Price Index (CPI)
A price index that measures the cost of a market basket of goods and services that a typical urban consumer purchases.

Producer Price Index (PPI)
A price index that measures changes in cost of goods and services purchased by the typical producer.

Inflation rate
The rate of change in the Consumer Price Index, which measures the growth rate of the average level of prices paid by consumers.

Price indexes measure changes in the average level of prices of the items included in the index. The major price indexes in the United States—the **Consumer Price Index (CPI)** and the **Producer Price Index (PPI)**—are computed and published monthly by the government. The CPI measures the average level of prices of a market basket of goods and services purchased by a typical urban consumer. The PPI measures changes in the cost of goods and services purchased by the typical producer. The **inflation rate** is the percentage change in one of these price indexes, with the CPI being most commonly used. For example, the CPI rose from an average of 188.9 in 2004 to 195.3 in 2005, an increase of 3.4 percent (195.3–188.9=6.4) and 6.4/188.9=.034=3.4 percent). Thus, the inflation rate, as measured by the CPI, during 2005 was 3.4 percent.

So far, so good. But where did the index number 188.9 come from, and what does it mean? The CPI is constructed by first selecting the *market basket of goods and services* representative of the purchases made by a typical urban household. Then, each month, the prices of the 200 categories of items included in this same market basket are surveyed. The hypothetical example in the following table illustrates how the resulting index and inflation rate are computed.

Year	Total Cost of Market Basket	Consumer Price Index	Annual Inflation Rate
1982–84	$500.00	100.0	—
1990	653.5	130.7	—
1991	681.00	136.2	4.2%
1992	701.50	140.3	3.0
1993	722.50	144.5	3.0
1994	741.00	148.2	2.6
1995	762.00	152.4	2.8
1996	784.50	156.9	3.0
1997	802.5	160.5	2.3
1998	815.00	163.0	1.6
1999	833.00	166.6	2.2
2000	861.00	172.2	3.4
2001	885.50	177.1	2.8
2002	899.50	179.9	1.6
2003	920.00	184.0	2.3
2004	944.50	188.9	2.7
2005	976.50	195.3	3.4
2006	1,003.00	201.6	3.2
2007	1,036.50	207.3	2.8
2008	1,076.50	215.3	3.8

Source: U.S. Department of Labor, Bureau of Labor Statistics, **http://www.bls.gov/cpi/home.htm**.

The years 1982–1984 are the base period years for computing the index. Prices of the market basket in future years are compared to the prices of the same market basket in 1982–1984—that is, $500. The Consumer Price Index (CPI) in a given year is displayed in the following equation:

$$CPI = [\text{cost of the market basket in the given year}]/[\text{cost of the market basket in the base period}] \times 100.$$

Accordingly, the CPI for 1982–1984 is 100, and for 2006, when the cost of the market basket rose to $1,076.50, the CPI is 215.3 because ($1,003.00/$500) 100 = 215.3. Literally, the CPI of 215.3 for 2008 means that prices were 115.3 percent higher in 2008 than in the 1982–1984 time period.

The nominal interest rate is positively related to the expected inflation rate. Now would be a good time to read the accompanying "Cracking the Code" on how to calculate the inflation rate.

Recap The nominal interest rate is the real interest rate plus the expected inflation rate. Money illusion occurs when investors react to nominal changes when no real changes have occurred. If expected inflation increases, the nominal interest rate will rise. Borrowers are then willing to pay an inflation premium, and lenders demand to be paid an inflation premium. Thus, nominal interest rates are correlated with expected inflation:

$$i = f(\overset{+}{Y}, \overset{-}{M}, \overset{+}{p^e})$$

THE CYCLICAL MOVEMENT OF INTEREST RATES

Suppose that, like Rip Van Winkle, you slept for a long time, and when you woke up, you read this chapter and Chapter 1. You would find yourself well rested and—believe it or not—quite able to explain how interest rates move over the business cycle and why they move as they do.

Recall from Chapter 1 that the stages of the business cycle are the recession, trough, expansion, and peak. The recession phase is usually characterized by falling incomes, a drop in the inflation rate (especially in the later stages of the phase), and, not surprisingly, given the Fed's desire to stabilize the economy, a rising money supply growth rate. Using Equation (5-10), we hope you would predict that such developments generally produce a decline in interest rates during recessions. Conversely, during the expansion phase of the cycle, income is rising, inflation usually reaccelerates (especially in the later stages of the phase), and the Fed may be trying to slow money supply growth to prevent an inflationary boom from developing. Again referring to Equation (5-10), you should not be surprised to learn that interest rates usually rise as an economic recovery proceeds. Generally speaking, although not always, interest rates tend to fluctuate procyclically—that is, they move with the business cycle, rising during expansions and falling during recessions.[12]

This chapter contains an appendix on how the price of a special type of bond, a bond with no maturity called a *consol*, changes as interest rates change.

Summary of Major Points

1. The interest rate is the return on lending today (spending in the future) and the cost of borrowing today (repaying in the future). It links the present with the future. More directly, the interest rate represents the time value of money and specifies the terms under which one can trade present purchasing power for future purchasing power.
2. Compounding answers this question: What is the future value of money lent today? It is the increase in the future value of funds that results from earning interest on interest. Discounting answers this question: What is the present value of money to be received in the future? As long as the interest rate is positive, $1,000 received today is worth more than $1,000 to be received in the future. Discounting is the procedure used to compute the present value of funds to be received in the future. Here again the interest rate links the present with the future.
3. A bond represents a stream of future payments. The price of a bond will be equal to the present value of the discounted future stream of income. When the interest rate changes, the present value of the future payments will also change. When interest rates rise, the prices of outstanding bonds fall. Likewise, when interest rates fall, the prices of outstanding bonds rise.

4. Ceteris paribus, the quantity demanded of loanable funds is inversely related to the interest rate. Ceteris paribus, the quantity supplied of loanable funds is directly related to the interest rate.
5. Changes in interest rates are the result of changes in the supply of funds and/or changes in the demand for funds. The supply of loanable funds results from the surpluses of net lenders and the provision of reserves by the Fed to the financial system. The demand for funds originates from the deficits run by net borrowers. The demand for loanable funds is positively related to income, Y, and positively related to anticipated increases in the productivity of capital investment. In general, anything that increases demand or reduces supply, ceteris paribus, will tend to raise interest rates. Anything that reduces demand or increases supply, ceteris paribus, will tend to lower interest rates. In summary,

$$i = f(\overset{+}{Y}, \overset{-}{M})$$

6. The nominal interest rate, i, is composed of a real interest rate, r, and an inflation premium, reflecting the expected inflation rate, p^e: $i = r + p^e$. In general, the willingness to lend and the willingness to borrow depend on the real return to lending and the real cost of borrowing where $r = i - p^e$. In summary,

$$i = f(\overset{+}{Y}, \overset{-}{M}, \overset{+}{p^e})$$

7. Interest rates tend to fluctuate procyclically. As a recession proceeds, income and GDP fall, tending to reduce the demand for funds, and the Fed's efforts to stabilize the economy generally result in a rising growth rate of the money supply. Conversely, as an expansion takes hold, incomes and GDP rise, tending to increase the demand for funds. Often inflation reaccelerates, and to prevent an inflationary boom from developing, the Fed will slow money supply growth. Reflecting such developments, interest rates will tend to rise.
8. The Consumer Price Index measures the average level of prices of goods and services that the typical urban consumer purchases. The price index is 100 in the base year. The rate of change in the price index is the rate of inflation.
9. A *consol* is a perpetual bond with no maturity date. The price of a consol is equal to the coupon payment divided by the nominal interest rate. (See Appendix 5A.)

Key Terms

Compounding, p. **92**
Consol, p. **110**
Consumer Price Index (CPI), p. **106**
Coupon Payments, p. **95**
Demand for Loanable Funds, p. **97**
Discount from Par, p. **96**
Discounting, p. **94**
Inflation Premium, p. **102**
Inflation Rate, p. **106**
Money Illusion, p. **102**
Nominal Interest Rate, p. **102**
Par Value, p. **95**
Premium above Par, p. **96**
Present Value, p. **94**
Principal, p. **93**
Producer Price Index (PPI), p. **106**
Real Interest Rate, p. **102**
Supply of Loanable Funds, p. **97**
Time Value of Money, p. **92**
Yield to Maturity, p. **96**

Review Questions

1. Define the concepts of *compounding* and *discounting*. Use future values and present values to explain how these concepts are related.
2. Use the concept of present value to explain why a trip to Hawaii next year would be valued more to most people than the same trip in the year 2015.
3. Under what conditions will a bond sell at a premium above par? At a discount from par?
4. During the Great Depression of the 1930s, nominal interest rates were close to zero. Explain how real interest rates could be very high even though nominal interest rates were very low. (*Hint*: Prices fell during parts of the Great Depression.)
5. Assume that after you graduate, you get a job as the chief financial officer of a small company. Explain why being able to forecast the direction of interest

rate changes may be critical for your success in that position. Likewise, why are investment bankers concerned about future changes in the interest rate?

6. What factors affect the demand for loanable funds? The supply of loanable funds?
7. In general, discuss the movement of interest rates, the money supply, and prices over the business cycle.
8. A young couple is borrowing $100,000 to buy their first home. An older couple is living off the interest income from the $100,000 in financial assets they own. How does the interest rate affect each couple? If the interest rate increases, could that change the behavior of either couple? How and why?

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

✓9. What is the present value of each of the following income streams?
   a. $100 to be received at the end of each of the next three years
   b. $100 to be received at the end of each of the next three years plus an additional payment of $1,000 at the end of the third year

✓10. What is the price of a bond that pays the income stream in question 9 (b)?

✓11. Assume that a bond with five years to maturity, a par value of $1,000, and a $60 annual coupon payment costs $1,100 today. What is the coupon rate? What is the current yield?

✓12. The nominal interest rate is 12 percent, and anticipated inflation is 8 percent. What is the real interest rate?

✓13. Graph the demand and supply for loanable funds. If there is an increase in income, ceteris paribus, show what happens to the interest rate, the demand for loanable funds, and the quantity supplied of loanable funds. If the Fed orchestrates a decrease in the money supply growth rate, ceteris paribus, show what happens to the interest rate, the supply of loanable funds, and the quantity demanded of loanable funds.

✓14. As an enrolling freshman, would you have been willing to pay $18,000 for four years' tuition rather than $5,000 per year for four years? (Assume you would be able to do so and that you have no fear of flunking out of college before you graduate.)

✓15. You win a million-dollar lottery to be paid out in 20 annual installments of $50,000 over the next 20 years. Assuming an interest rate of 6 percent, how large a payment would you accept today for this future stream of income?

✓16. Jake is given $10,000 in a CD that matures in 10 years. Assuming that interest payments are reinvested during the life of the CD, how much will the CD be worth at maturity if the interest rate is 5 percent? If the interest rate is 10 percent?

✓17. Henry and Sheree just had a baby. How much will they have to invest today for the baby to have $100,000 for college in 18 years if the interest rate is 5 percent? If the interest rate is 10 percent?

18. Use graphical analysis to show that if Y and M both increase, the interest rate may increase, decrease, or stay the same. In each case, what happens to the equilibrium quantity demanded and supplied?

19. Using Exhibit 5-6, determine in what years real interest rates were at their highest and lowest levels.

✓20. Assume that the price of a market basket of goods and services is $2,000 in the base period, $2,060 one year later, and $2,100 two years later. What is the price index in the base period? After the first year? After the second year? What is the rate of inflation in the first year? In the second year?

✓21. What is the price of a consol with a coupon payment of $200 per year if the interest rate is 10 percent? What is the interest rate on a consol if the coupon payment is $400 and the price of the consol is $8,000? (*See Appendix 5A.*)

✓22. I purchase a consol with a coupon payment of $100 when the interest rate is 10 percent. When I sell the consol, the interest rate has risen to 20 percent. What is the amount of my capital gain or loss? (*See Appendix 5A.*)

Suggested Readings

The article "The Cyclical Behavior of Interest Rates," *Journal of Finance* 52 (September 1997): 1519–42, offers an advanced discussion of interest rates.

A classic work dealing with interest rate determination is Irving Fisher, *The Theory of Interest* (New York: Macmillan, 1930). A more recent article, "The Fisher Hypothesis Revisited: New Evidence," finds that nominal interest rates are directly related to expected inflation rates and government borrowing. It can be found in *Applied Economics* 29 (August 1997): 1055–59.

For a basic discussion of the "Fisher Effect," see the Internet site **http://en.wikipedia.org/wiki/Fisher_hypothesis.**

For an interesting article on the relationship between interest rates and inflation, see Edward Renshaw, "Inflation and the Search for a Neutral Rate of Return on T-Bills," *Challenge* (November-December 1994): 58–61.

For an analysis of the relationship between interest rates and bond prices, see Dale Bremmer, "The Relationship Between Interest Rates and Bond Prices," *American Economist* 36 (Spring 1992): 85–86.

For information on estimating yields on Treasury securities, see **http://www.newyorkfed.org/aboutthefed/fedpoint/fed28.html.**

Information on interest rate calculations can be found online at **http://www.newyorkfed.org/education/interest_rates.html.**

Appendix 5A
The Inverse Relationship Between Bond Prices and Interest Rates: The Case of Consols

Consol
A perpetual bond with no maturity date; the issuer is never obliged to repay the principal but makes coupon payments each year, forever.

A type of bond called a **consol** has no maturity date. The issuer is not obligated to ever repay the principal but makes coupon payments each year forever. Thus, if I buy a consol today, I am entitled to receive the coupon payment forever but never to be repaid the principal. After some mathematical manipulation and simplification of Equation (5-6), found in endnote 13, such characteristics imply the following:[13]

$$i = C/P$$

The yield to maturity, or interest rate, i, on a consol is equal to the coupon payment, C, divided by the price of the bond, P. Suppose a new $1,000 face value consol is issued today and promises to pay $50 in interest each year. This is the coupon payment each year. Assuming the price of the new consol is $1,000, the $50 divided by the price shows that the consol yields 5 percent ($50/$1,000 = .05).

Now assume that a year later another $1,000 consol is issued by the same company. Suppose the prevailing level of interest rates in the economy has risen so that the new consol will have to pay $60 a year in interest to be competitive. Clearly, the new consol is a better investment than the one-year-old 5 percent consol.

Suppose that some unforeseen financial problems lead the owner of the old 5 percent consol to sell it. Who would be willing to purchase the old 5 percent consol, given that they could instead purchase a new 6 percent consol? The answer is nobody, at least not yet. The older consol will have to yield 6 percent to be sold, and it will sell if it can somehow be made to yield 6 percent.

The older consol cannot change the fact that it pays $50 a year in interest. However, the old consol can sell for a lower price. If the price drops to $833.33, then $50 a year interest would represent a yield of 6 percent ($50/$833.33 = .06). In fact, this is exactly what will happen. The owner of the old consol will offer the bond for sale at $1,000—the original price. Because no buyers appear, the market maker handling the transaction will

lower the price. The price cutting will continue until buyers appear; this will occur when the price falls to $833.33, because at this point the yield on the old consol is competitive with the yield on new consols. Finally, what if the interest rate on new bonds falls to 4 percent? What will happen to the price of the old consol and why?[14]

Endnotes

1. If Joe received the interest earned on the loan after one year but left the principal, the total return over two years would be $120, or $60 each year. The average annual rate of return would be 6 percent [.06 = ($120/$1,000) ÷ 2], which is simple interest. If, as in the example, no interest payment is made after one year—the funds being, in effect, re-lent or reinvested—the total return is $123.60, and the compound annual return is 6.18 percent [.0618 = ($123.60/$1,000) ÷ 2]. The compound rate will always be higher than the simple rate due to the interest earned on interest.
2. For those who would like to work through all the steps, start with $V_2 = V_0 + iV_0 + i(V_0 + iV_0)$ $= V_0 + iV_0 + iV_0 + i^2V_0 = V_0 + 2iV_0 + i^2V_0 = V_0(1 + 2i + i^2) = V_0(1 + i)(1 + i) = V_0(1 + i)^2$.
3. We are also assuming that she expects the interest rate to be 6 percent for the next five years.
4. The present value of $7,500,000 to be received in five years, assuming an interest rate of 4 percent, is $6,164,453.30. This is obviously more than $6,000,000. Put another way, if the actress took the $6,000,000 today and lent it at 4 percent for five years, she would have only $7,299,917.41 at the end of the period rather than $7,500,000. The $6,164,453.30 is what she would need to lend today at 4 percent for five years to have $7,500,000 at the end of the period. In sum, the actress should take the $7,500,000 in five years rather than the $6,000,000 today.
5. Are you puzzled by the fact that the price of the bond in the marketplace equals the present value of the bond? If so, think of what happens in any market when a product is selling for less or more than buyers and sellers think it's really worth. If it is selling for less, quantity demanded will be greater than quantity supplied, and the price will rise in response. If it is selling for more, quantity demanded will be less than quantity supplied, and the price will fall in response. Equilibrium is reached when the prevailing price in the market is such that quantity demanded equals quantity supplied. So, too, in financial markets.
6. Technically, the time to maturity is now one year less a day, but to simplify, we ignore the one day.
7. In Chapter 23, we will see that the managers could also use financial futures markets to reduce the risk of losses from changes in interest rates.
8. The federal government's demand for loanable funds is less sensitive to changes in the level of interest rates than are the other sectors. The federal government does not necessarily borrow less at higher interest rates than at lower interest rates. Ceteris paribus, as interest rates rise, the government may actually borrow more because of higher interest payments on the outstanding national debt.
9. See any principles of economics text for a more detailed definition of GDP.
10. Later in the text, we shall see that continuous increases in the growth rate of the money supply can lead to inflation, changes in inflationary expectations, and possible increases in interest rates.
11. This equation is a reduced-form equation resulting from simultaneously solving a demand and supply equation for loanable funds.
12. The correlation between the business cycle and interest rates is far from perfect. For example, during the expansion that began in the early 1990s and ended in the early 2000s, interest rates did not behave in the same manner described.
13. From Equation (5-6), the price of a consol is equal to $P = C/(1 + i)^1 + C/(1 + i)^2 + C/(1 + i)^3 + C/(1 + i)^4 + \ldots = C[1/(1 + i) + 1/(1 + i)^2 + 1/(1 + i)^3 + 1/(1 + i)^4 + \ldots] = C(1/i) = C/i$. Therefore, $i = C/P$.
14. The old consol represents a future stream of income of $50 per year forever. At an interest rate of 4 percent, the price rises to $1,250 ($50/.04 = $1,250), and the lucky owner makes a capital gain of $250.

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CHAPTER SIX

6

Time gives good advice.

—Maltese proverb

The Structure of Interest Rates

Learning Objectives

After reading this chapter, you should know:

What a yield curve is

What the expectations theory is

How expectations influence interest rates

What determines expectations

How term to maturity, credit risk, liquidity, and tax treatment affect interest rates

FROM ONE INTEREST RATE TO MANY

A familiar term we hope you have come to know and understand is the *interest rate*. Before you become too attached, however, the time has come to confess the obvious. Previous chapters have discussed in some detail what determines the interest rate as if there were just one interest rate. This simplification allowed us to abstract from many details and focus on the essential factors influencing interest rates in general. Of course, the real world is more complicated.

Numerous types of financial claims are traded in financial markets—Treasury bills, corporate bonds, municipal bonds, commercial paper, certificates of deposit, and Treasury notes and bonds, to name just a few. A glance at any newspaper reveals that the interest rates on the various types of financial claims differ. Lest you be overwhelmed by such differences, remember that our objective is to bring order to chaos. More specifically, we want (1) to explain the patterns and common threads that link the various interest rates together and (2) to identify the factors that explain the differences.

Simply put, interest rates generally move up and down together. All rates may not move by the same amount, and occasionally some rates may not even move in the same direction as the rest. As a result of such disparate movements, the spreads, or patterns of relationships, between rates can change. For example, the spread between Treasury bill rates and Treasury note rates may narrow while the spread between the rates on risky corporate bonds and the rates on those that are less risky may widen.

The purpose of this chapter is to study the factors that are primarily responsible for determining the relationships among interest rates. Financial analysts have isolated and identified four primary determinants of these relationships: (1) term to maturity, (2) credit risk, (3) liquidity, and (4) tax treatment.

Why is it important to know all of this, you ask? There are many possible responses, but this hypothetical example should suffice. Suppose you have $1 million available to purchase financial claims and you have narrowed your options to one-year Treasury notes yielding 3 percent, two-year Treasury notes yielding 4 percent, and two-year municipal notes yielding 2 percent. Which would you choose? More to the point, what would you need to know before you or any portfolio manager could make a rational decision? This chapter will provide answers to such questions.

THE ROLE OF TERM TO MATURITY IN INTEREST RATE DIFFERENTIALS

Treasury Notes
Securities issued by the U.S. government with an original maturity of 1 to 10 years.

Term Structure of Interest Rates
The relationship between yields and time to maturity.

Yield Curve
A graphical representation of the relationship between interest rates (yields) on particular securities and their terms to maturity.

The U.S. Treasury issues different types of securities—bills, notes, and bonds—as it manages the nation's debt or finances a government budget deficit, if any. The major characteristic distinguishing one type of Treasury security from another is the term to maturity. For example, Treasury bills have short terms to maturity of one year or less, while **Treasury notes** and bonds have long terms to maturity of one year or more.[1] We are interested in discovering what determines the relationship between interest rates on Treasury securities of different maturities. For example, what is the relationship between the interest rate on a Treasury security with a short term to maturity and the interest rate on a Treasury security with a long term to maturity? The pattern of relationships among interest rates and the time to maturity are usually referred to in financial markets as the **term structure of interest rates.**

The Yield Curve

A common analytical construct used as a framework for addressing this question is a yield curve. Formally, a **yield curve** is a graphical representation of the relationship

between interest rates (yields) on particular financial instruments (securities) and their terms to maturity. Put another way, a yield curve visually represents the term structure of interest rates—that is, it shows how interest rates vary with the term to maturity.

When constructing yield curves for the purpose of examining the role of term to maturity in explaining interest rate differentials, analysts traditionally focus on Treasury securities. By concentrating on one particular type of security, we can control for factors other than term to maturity, such as riskiness and tax treatment, which could also affect the structure of yields.[2] In other words, focusing on Treasury securities permits us to isolate the effects of term to maturity. Although we use U.S. government securities, we could have used other types of assets to demonstrate yield curves. Other financial instruments (securities) that could be used include corporate bonds with the same default risk (and other non-maturity-related characteristics) or municipal bonds. Just be sure you understand that each individual asset is usually represented on a single yield curve, even though several yield curves may be drawn on one graph.

To construct yield curves, we begin with Exhibit 6-1. This table shows the interest rates on U.S. Treasury securities of different maturities prevailing on four different dates: January 16, 1981; January 29, 1993; June 1, 2003; and May 7, 2007. From this information, we can construct four different yield curves—one for each of the four dates. Term to maturity is always measured on the horizontal axis, while the return on an asset (yield to maturity) is measured on the vertical.

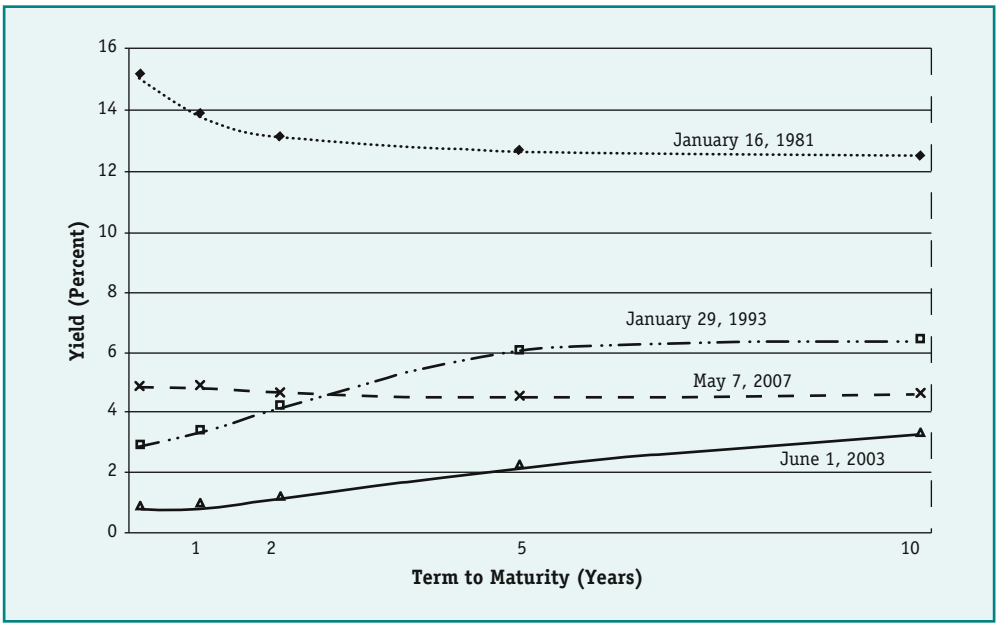
Using the data in Exhibit 6-1, the yield curves for the four dates are plotted in Exhibit 6-2. Notice that on January 16, 1981, the yield on three-month Treasury bills was 15.19 percent, while the yield on 10-year Treasury bonds was 12.53 percent. Thus, the slope of the yield curve at that time was negative, meaning that yields declined as the term to maturity increased. In contrast, on January 29, 1993, the yield curve had a positive slope, which means that yields rose with term to maturity. On this day, the yield on three-month Treasury bills was 2.92 percent, while the yield on 10-year Treasury bonds was 6.46 percent. Thus, the slope of the yield curve changed over time. Notice also that all 1993 yields were below all 1981 yields. This indicates that the level of the yield curve as well as the direction of the slope changed.

Next, look at the yield curve for June 1, 2003. On this date, the yield on three-month Treasury bills was less than 1 percent, while the yield on the 10-year security was 3.33 percent. Although upward sloping (slightly), the yield curve was much lower than in the previous years, reflecting the fact that in mid-2003, interest rates had fallen to 45-year lows. Finally, look at the yield curve for May 7, 2007. In this case, the two-, five-, and 10-year rates are all lower than the one-year rate of 4.92 percent. However, the total fluctuation over the entire maturity range is .37 percent (from 4.55 to 4.92 percent) and the yield curve is relatively flat. As you can see, there can be much variation in the shape and level among yield curves for the same financial instrument on different dates!

6-1
Interest Rates on Treasury Securities

Term to Maturity	January 16, 1981	January 29, 1993	June 1, 2003	May 7, 2007
3 months	15.19%	2.92%	0.92%	4.89%
1 year	13.91	3.41	1.01	4.92
2 year	13.15	4.24	1.23	4.68
5 year	12.69	6.08	2.27	4.55
10 year	12.53	6.46	3.33	4.64

Sources: Federal Reserve Bulletin and *The Statistical Supplement to the Federal Reserve Bulletin,* various issues (1981–2007).



As mentioned earlier, the slope (shape) and position (level) of the yield curve are called the *term structure of interest rates.* We are interested in explaining what determines the term structure—that is, the shape of the yield curve and its level. Although much has been written to explain the term structure of interest rates, the conventional wisdom can be boiled down to expectations theory and some modifications of that theory. To simplify the explanation of the theory and the modifications, we shall assume that there are only two types of Treasury securities: T-bills with a short term to maturity (one year) and Treasury notes with a long term to maturity (two years). We shall develop our analysis in terms of the demand for and supply of these two securities.

In Chapter 5, we discussed interest rate determination in terms of the supply of and demand for loanable funds. By now you should be able to see that when we supply loanable funds, we demand financial securities, and when we demand loanable funds, we supply financial securities. Thus, developing our analysis of the expectations theory in terms of the demand for and supply of financial securities is consistent with our previous discussion.

Recap The yield curve is a graphical representation of the relationship between the interest rate (yield) and the term to maturity. Yield curves show how interest rates vary with term to maturity.

THE EXPECTATIONS THEORY

Expectations Theory
A theory holding that the long-term interest rate is the geometric average of the present short-term rate and the short-term rates expected to prevail over the term to maturity of the long-term security.

Simply put, the **expectations theory** postulates that (1) the yield curve is determined by borrowers' and lenders' expectations of future interest rates and (2) changes in the slope (shape) of the curve result from changes in these expectations. More specifically, the expectations theory postulates that the long rate is the geometric average of the current short rate and the future short rates expected to prevail over the term to maturity of the longer-term security.

To understand the expectations theory, let us begin by assuming that you have funds to lend for a two-year period. The current yield, i_1, on a one-year bill (a short-term

security) is 5 percent per year, and the current yield, i_2, on a two-year note (a long-term security) is 5.99 percent per year. Now suppose that you and everyone else with funds available to lend expect that the yield on short-term (one-year) securities, i_1^e, will be 7 percent one year from now. Assuming that you have no preference as to holding one-year or two-year securities—that is, you do not have a preference for either short- or long-term securities—which would you acquire now? If you are a wise investor, we predict you will acquire the security with the higher expected rate of return. Think of yourself as having two options: Option A is to buy short-term (one-year) securities today and short-term securities again one year from now; Option B is to buy long-term (two-year) securities now. Which of the options gives the higher expected rate of return?

The answer is derived in two simple steps: (1) calculate the expected return from acquiring the one-year bill now and the one-year bill one year from now; (2) compare it with the 5.99 percent return you would earn by acquiring the two-year note now.

Geometric Average
An average that takes into account the effects of compounding; used to calculate the long-term rate from the short-term rate and the short-term rates expected to prevail over the term to maturity of the long-term security.

To calculate the expected return of the one-year bill now and the one-year bill one year from now, we find the **geometric average** of the two rates. We use the geometric average instead of the simple arithmetic average to take into account the effects of compounding as discussed in Chapter 5. In other words, the use of the geometric average assumes that the interest earned the first year will earn interest during the second year. More precisely, using the geometric average, the long rate, i_2, can be calculated as follows:

$$(1 + i_2) = [(1 + i_1)(1 + i_1^e)]^{1/2} \tag{6-1}$$

Subtracting 1 from both sides of Equation (6-1) yields

$$i_2 = [(1 + i_1)(1 + i_1^e)]^{1/2} - 1 \tag{6-2}$$

Returning to our numerical example, if we perform these calculations, we find that the expected return associated with Option A is 5.99 percent. More specifically, plugging the present one-year rate and expected one-year rate into Equations (6-1) and (6-2) yields

$$(1 + i_2) = [(1 + .05)(1 + .07)]^{1/2} = [(1.05)(1.07)]^{1/2} = (1.1235)^{1/2} = 1.0599$$

and

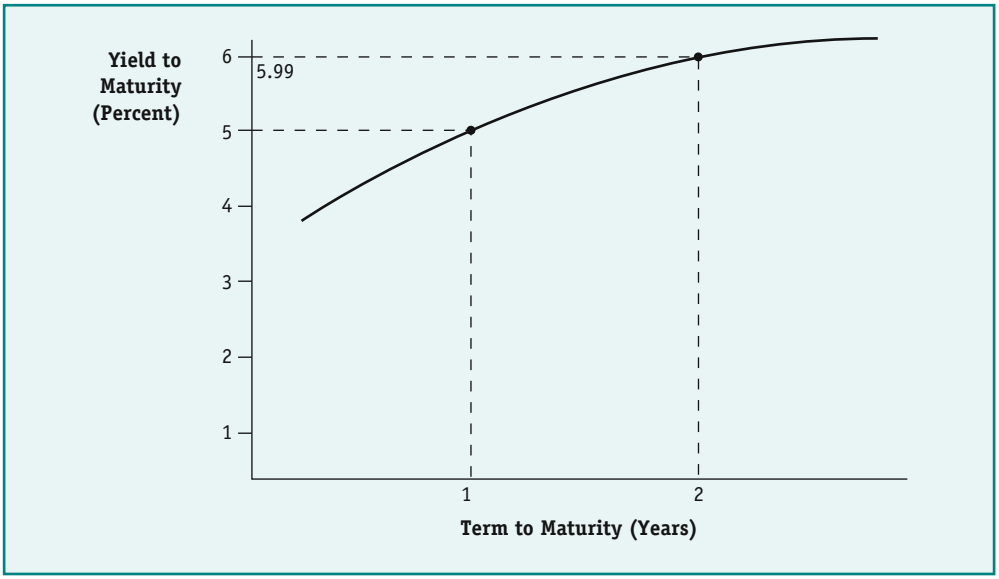
$$i_2 = 1.0599 - 1 = .0599 = 5.99 \text{ percent}$$

This is the geometric average of the short rate now, i_1, and the short rate expected to prevail one year from now, i_1^e. The expected return from Option B—acquiring the two-year note—is also 5.99 percent. Because both options provide the same expected return, you and other lenders (buyers of securities) will be indifferent between the two options and perhaps will purchase both short-term and long-term securities. Because the long rate is, in fact, equal to the geometric average of the current short rate and the short rate expected to prevail one year in the future, we have an equilibrium configuration or term structure of interest rates. The associated yield curve is shown in Exhibit 6-3.

Our example does not prove the expectations theory postulated earlier; after all, we chose the numbers in the example. What happens when the numbers change?

To get the answer and in the process explain how the theory works, go back to our example and assume the one-year rate and two-year rate initially remain at 5 percent and 5.99 percent, respectively, but that expectations about future rates change such that the one-year rate expected to prevail one year from now rises from 7 to 9 percent. What would you and other potential purchasers of securities do, and how would those actions affect the term structure—that is, the slope and level of the yield curve in Exhibit 6-3?

6-3
Hypothetical Yield Curve



If the interest rate on a one-year security is 5 percent and the one-year rate expected to prevail one year from now is 7 percent, then the two-year rate is 5.99 percent. Because the future expected one-year rate is above the present one-year rate, the yield curve is upward sloping.

You and other financial investors would presumably first recalculate the expected return from Option A (buy short-term securities now and again one year from now) and compare it to the expected return from Option B (buy long-term securities now). We use Equation (6-2) to calculate the geometric average—the expected return—of Option A. The calculation reveals that the expected return is 6.98 percent: $.0698 = [(1.05)(1.09)]^{1/2} - 1$. Because this is higher than the 5.99 percent return associated with Option B, you and others will want short-term securities. In fact, those who own long-term securities will want to sell them and buy short-term securities. What will happen as the demand for long-term securities falls in the market? We hope you said the price of these long-term securities will fall and, thus, ceteris paribus, their yields will rise.

How far will this portfolio reshuffling go? Or, to put it somewhat differently, how high will long rates rise? Given our theory, and assuming the short rate remains at 5 percent and the expected short rate remains at 9 percent, the long rate will have to rise to 6.98 percent.[3]

Why 6.98 percent? This is the only rate that will equate the expected returns from Options A and B and thus leave financial investors indifferent between them. If investors are indifferent, there is no tendency to change, and an equilibrium configuration or term structure of interest rates is realized. More formally, a 6.98 percent interest rate on the two-year note, i_2, will make it equal to the geometric average of the prevailing 5 percent one-year rate, i_1, and the 9 percent one-year rate expected to prevail one year from now, i_1^e. The relationship between long-term interest rates and short-term interest rates depends directly on interest rate expectations; as i_1^e changes, i_2 will change relative to i_1.[4]

In our example, the adjustment in the long (two-year) rate from 5.99 to 6.98 percent as a result of the change in interest rate expectations was developed from the demand side of the market for securities, that is, from the point of view of the lender. But do not forget that the securities market also has a supply side. The expectations of the

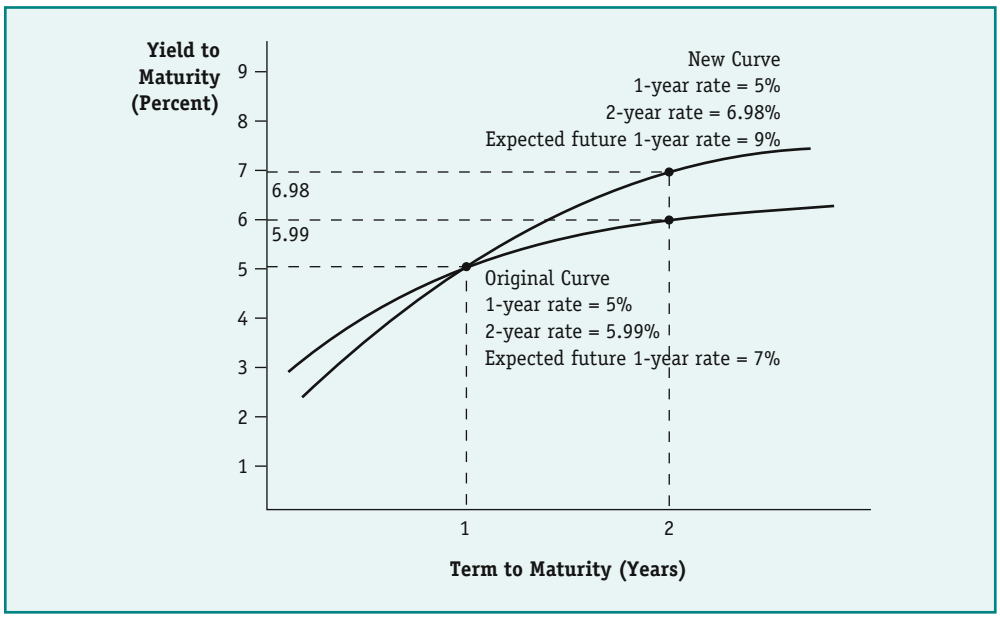
borrower are also important. Suppose you need funds for two years and can either issue a security for two years with an interest rate of 5.99 percent or issue a one-year security at 5 percent now and another one-year security one year from now at an expected 9 percent rate. Which option would you choose? Again, if you are a wise borrower, we assume you will choose the option that minimizes the cost of borrowing and thus maximizes utility or profits. Accordingly, you would issue a two-year security with an annual interest rate of 5.99 percent rather than sell two consecutive one-year securities having an expected average annual interest rate of 6.98 percent.

When borrowers believe that the average of current and expected future interest rates on short-term securities exceeds the rate on long-term securities, they will increase their current supply of long-term securities, thus tending to raise the long-term interest rate. In other words, because borrowers will want to issue two-year notes, the supply of the notes will increase (causing their price to fall), ceteris paribus, and thus higher interest rates will have to be paid on them. The market will be in equilibrium when the quantity of notes supplied equals the quantity of notes demanded.[5]

Taken together, the effects of interest rate expectations of investors and borrowers on the demand for and supply of securities, respectively, will determine the term structure of interest rates. More specifically, if, as in our example, expectations about future interest rates change such that future rates are expected to be higher, the original yield curve in Exhibit 6-3 will turn into the new yield curve in Exhibit 6-4. As the demand for long-term securities falls and the supply rises, the price of longs will fall, and the long rate will rise relative to the short rate, resulting in a steepening of the yield curve.

The last few paragraphs have been jam-packed with information. Let's try to summarize and nail down some implications of the key points. First, the hypothetical yield curve accompanying our initial example, shown in Exhibit 6-3, is positively sloped—that is, yields rise with term to maturity. The explanation for the slope of the yield curve

6-4
Hypothetical Yield Curve



If the interest rate on a one-year security is 5 percent and the one-year rate expected to prevail one year from now increases to 9 percent, then the new two-year rate is 6.98 percent.

is directly related to the interest rate expected to prevail on short-term securities one year in the future—hence, the term *expectations theory*. More specifically, the positively sloped yield curve reflects expectations of a rise in the interest rate on short-term securities over the course of the year from the currently prevailing 5 percent to 7 percent.

Second, the new hypothetical yield curve accompanying our second example, where the expected future rate rose from 7 percent to 9 percent, is, as shown in Exhibit 6-4, even more positively sloped than the original curve. The explanation for the change in the slope is the change in future interest rate expectations. More specifically, the steeper slope reflects expectations of an even larger rise in the interest rate on short-term securities over the course of the year—that is, from the currently prevailing 5 percent to 9 percent rather than from 5 to 7 percent as in the previous example.

Third, the change in the slope of the yield curve, which accompanies a change in interest rate expectations, does not come about magically. Rather, it reflects changes in the supply of and demand for securities, which are induced by the change in interest rate expectations.

Fourth, assuming the expectations theory is basically correct, we can solve for the interest rate expected to prevail in the future by looking at the current structure of rates and doing some simple algebra. We start by squaring both sides of Equation (6-1):

$$(6\text{-}3A) \qquad (1+i_2)^2 = \{[(1+i_1)(1+i_1^e)]^{1/2}\}^2 = (1+i_1)(1+i_1^e)$$

We then divide through by $(1+i_1)$ to get

$$(6\text{-}3B) \qquad (1+i_2)^2/(1+i_1) = (1+i_1^e)$$

Subtracting 1 from both sides of the equation, we arrive at Equation (6-3):

$$(6\text{-}3) \qquad i_1^e = [(1+i_2)^2/(1+i_1)] - 1$$

Returning to our numerical example, if we know that the one-year rate is 5 percent and the two-year rate is 5.99 percent, as in our first example, we can plug the relevant numbers into Equation (6-3) and solve for i_1^e. Specifically,

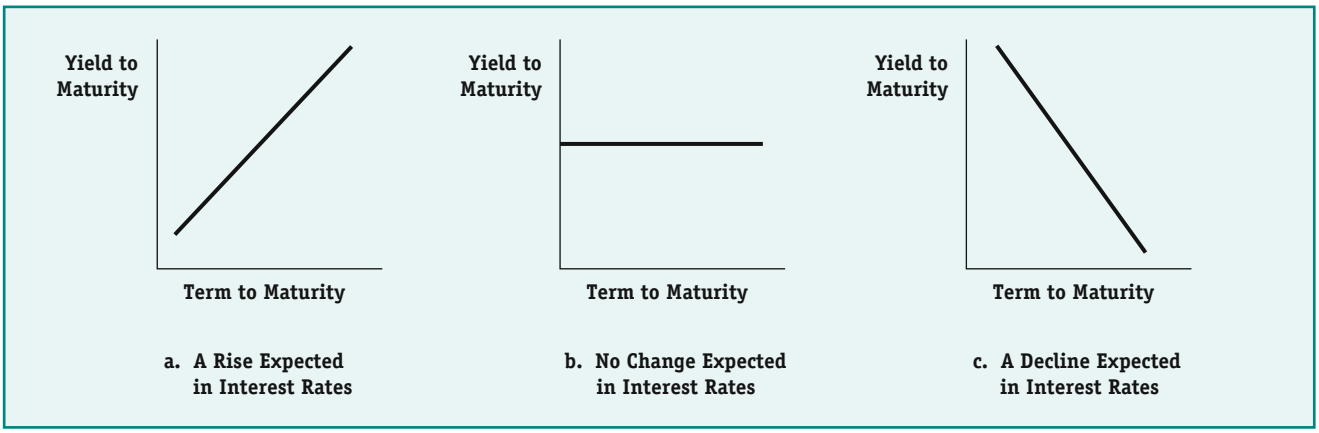
$$i_1^e = [(1.0599)^2/(1.05)] - 1 = .07 = 7 \text{ percent.}$$

If, instead, we observe in the market that the one-year rate is 5 percent and the two-year rate is 4.5 percent, we can use Equation (6-3) to find that the expected rate on a one-year security bought one year from now is approximately 4 percent: $i_1^e = [(1 + .045)^2/(1 + .05)] - 1 = .04$. Thus, based on the expectations theory, you can look at the yield curve and infer the market's expectation for the direction and level of future short-term interest rates.

Exhibit 6-5 shows the three most common shapes of the yield curve. Exhibit 6-5a shows a rising or positively sloped yield curve. When a rising yield curve is observed in the market, the implication under the expectations theory is that market participants expect future short-term interest rates, i_s^e, to rise above current short rates, i_s; that is, $i_s^e > i_s$. A horizontal or flat yield curve, as shown in Exhibit 6-5b, implies that interest rates are expected to remain constant, $i_s^e = i_s$. A declining or negatively sloped yield curve, as in Exhibit 6-5c, implies that interest rates are expected to decrease in the future, $i_s^e < i_s$.

You now know enough to say quite a lot about the actual data and yield curves in Exhibits 6-1 and 6-2. Referring to the yield curves shown in Exhibit 6-2, the expectations theory tells us that the shape of the January 16, 1981, curve indicates that investors expect future short-term rates to decline. Because, according to the expectations theory, the two-year rate is the average of the current one-year rate and the one-year rate expected one year from now, the one-year rate expected to prevail one year from now must be less than the current one-year rate. Using the data in the table in Exhibit 6-1, the

6-5
Alternative Yield Curve Shapes



expected one-year rate can be found by plugging the one- and two-year rates into Equation (6-3) and solving for the one-year expected rate. In this case, the one-year expected rate is 12.395 percent; since 12.395 percent = .12395 = $[(1 + .1315)^2/(1 + .1391)] - 1$.

According to the expectations theory, the shapes of the January 29, 1993, and June 1, 2003, curves indicate that, in both cases, investors expected future short-term rates to rise, but by different amounts. See if you can figure out the one-year rate that was expected to prevail one year from each of the three dates.[6] Finally, on May 7, 2007, the expectations theory suggests that investors expect little change in the level of interest rates.

Lastly, please note that the whole expectations theory is rather empty unless and until you can explain what determines future interest rate expectations and changes in those expectations. Otherwise, you have a theory explaining the term structure via expectations that are left unexplained.

Recap According to the expectations theory, the long-term interest rate is the geometric average of the short-term rate and the short-term rates expected to prevail over the term to maturity. Given the one-year rate and the two-year rate, we can solve for the expected one-year rate one year from now.

DETERMINING INTEREST RATE EXPECTATIONS

Since expectations play such a pivotal role, then, the next question is what determines interest rate expectations. The answer is much easier than you might think. In the last chapter, we examined the determinants of the interest rate and developed a general expression—Equation (5-10)—that brought together the most important supply and demand influences on the interest rate.[7] This expression is now Equation (6-4):

$$i = f(\overset{+}{Y}, \overset{-}{M}, \overset{+}{p^e}) \qquad (6\text{-}4)$$

where Y = national income or gross domestic product,
M = the money supply, and
p^e = inflationary expectations.

The signs over the variables indicate that a rise in income or inflationary expectations will tend to raise the interest rate and that an increase in the money supply will tend to reduce the interest rate.

Now, assuming that we want to know what determines the expected short-term interest rate, i_s^e, how can Equation (6-4) be of help? The answer is straightforward: if the current short-term interest rate is determined by Y, M, and p^e, then the expected short-term interest rate must be determined by expectations about Y, M, and p^e. In other words,

$$i_s^e = f(\overset{+}{Y^e}, \overset{-}{M^e}, \overset{+}{p^e}) \tag{6-5}$$

the expected short-term interest rate, i_s^e, is a positive function of expectations about future income and inflation and a negative function of expectations about the future money supply.[8]

Tying the Determinants of Expectations to the Changing Shape and Level of Yield Curves

We have learned that a positively sloped yield curve reflects expectations of rising interest rates. Using Equation (6-5), we can be even more specific; a positively sloped yield curve reflects expectations of some combination of future increases in income and inflation and possibly some reduction in the future growth rate of the money supply—developments that would all tend to raise future short-term interest rates. Conversely, a negatively sloped yield curve usually reflects expectations of some combination of future declines in income and inflation and possibly some accompanying increase in the future growth rate of the money supply—developments that would all tend to lower short-term interest rates in the future.

Next, ask yourself at what stage of the business cycle you would expect to observe a positively sloped yield curve. The answer is the stage when the future appears to hold some growth in income, a rise in prices, and perhaps slower growth of the money supply. This typically occurs at a business cycle trough and during the first half of a recovery. During the previous recession, real income fell, inflation decelerated, and the Fed responded with a more stimulative policy, resulting in a rise in the money supply growth rate. All of these developments contributed to a fall in the prevailing short-term interest rate and set in motion the forces of economic recovery. As the economy bottoms out and begins to recover, market participants expect future income and prices to rise as aggregate demand for goods and services increases, and they expect the Fed to be less stimulative so as to avoid an inflationary boom.[9] As a result, market participants expect future short-term interest rates to be higher than the prevailing level of short-term rates.

What about a negatively sloped yield curve? At what stage of the business cycle would market participants expect the future to bring a fall in income and inflation and Fed actions to increase the growth of the money supply? These developments usually occur around business cycle peaks including the late part of a recovery or expansion and the early part of a recession. Typically, income and prices have been rising quickly, and the Fed has moved to slow monetary growth—that is, "tighten" policy—to head off further surges in the inflation rate. As Equation (6-4) would lead one to predict, such developments have pushed up the prevailing level of short-term rates and set in motion forces that in the future are expected to lead to some slowdown in income, deceleration of inflation, and, after a time, a less restrictive monetary policy. Simply put then, future short-term rates are expected to be lower than the prevailing level of short-term rates; hence, we observe a negatively sloped yield curve.

Going back once again to Exhibit 6-2, we hope you are not surprised to learn that shapes of the yield curves somewhat coincide with what was going on in the economy at the time. For example, January 16, 1981, fell around a business cycle peak (the exact peak was July 1981).[10] January 29, 1993, fell during the lengthy beginning of a weak recovery. June 1, 2003, came after two and one-half years of economic weakness, a recession, and a jobless recovery. Finally, May 7, 2007 came at a time when the growth rate of the economy was faltering, and the Fed had stopped taking actions that raised short-term rates a year earlier. The change in the shape of the yield curve among the four dates reflects changes in interest rate expectations. The changes in interest rate expectations, in turn, reflect expected changes in the performance of the economy (income and prices) and expected changes in the stance of monetary policy (specifically, the money supply growth rate). Such changes are typically observed as the economy moves from one stage of the business cycle to another.

Recap

Because $i = f(\overset{+}{Y}, \overset{-}{M}, \overset{+}{p^e})$, then $i_s^e = f(\overset{+}{Y^e}, \overset{-}{M^e}, \overset{+}{p^e})$. If Y^e, M^e, or p^e changes, then i_s^e changes. Changes in i_s^e cause the yield curve to shift.

Having identified and explained the major factors underlying the different shapes of the yield curves in Exhibit 6-2, we have one task left: to explain the different levels of the yield curves—that is, why all the rates prevailing in 1993, 2003, and 2007 were below the rates in 1981, why short-term rates were higher and long-term rates lower in 2003 than in 1993, and why short-term rates in 2007 were much higher (almost 4 percent) than in 2003 while long-term rates were only about 1.5 percent higher than in 2003. We can address this issue in two parts:

1. In part, the difference in interest rates is due to the cyclical pattern of interest rates related to real economic activity and the supply of and demand for loanable funds. This part of the answer was discussed in Chapter 5. Expectations about the returns on financial securities and the returns to capital, the business outlook, and any other factors that influence the demand for and supply of funds will affect the level of the yield curve.
2. The second part of the answer is embedded in Equations (6-4) and (6-5). In 1993, inflationary pressures were lower than in the 1980s, and the economy was experiencing a mild recovery. In January 1981, the inflation rate was about 11 percent and was expected to fall to about 7 to 8 percent in coming years. Thus, in 1993 with the prevailing and expected inflation rates below those prevailing and expected in 1981, the inflation premiums embedded in both short- and long-term interest rates were considerably smaller than the inflation premiums embedded in short- and long-term rates in 1981. In 1993, Fed policy was keeping short-term rates abnormally low. Actual short-term rates were about equal to the inflation rate, yielding a real return of zero. The Fed adopted this strategy, which we will look at in more depth in a later chapter, to help the banking sector recover from massive losses experienced in the 1980s. But short-term interest rates could not remain so low forever, and the Fed increased them over the course of 1994. In 2003, the U.S. economy was struggling to pull itself out of a recession that had resulted from the bursting of the stock market bubble in early 2000, the terrorist attack on September 11, 2001, and the subsequent war against terror. Consequently, fears of deflation led to the lowest interest rates in 40 years, with the Fed reiterating that it did not see interest rates rising in the near future. However, by mid 2006, the Fed orchestrated 17 rate increases for short-term rates. Faced

with a global glut of capital, moderate growth rates, and subdued fear of inflation despite high oil prices in mid 2007, long-term rates had not increased nearly as much as short-term rates.

SOME NECESSARY MODIFICATIONS TO THE EXPECTATIONS THEORY

The expectations theory of the term structure provides a powerful and widely accepted explanation for the relationship between long- and short-term interest rates. However, many researchers, taking note of several historical and institutional features of financial markets, have argued that the expectations theory needs to be modified somewhat to make it a more complete explanation of the term structure. First, it has been observed that over the last 50 years, yield curves have almost always been positively sloped. Taken literally, this would imply that financial market participants have almost always expected short-term interest rates to rise. Given the ups and downs in the economy and the accompanying fluctuations in the supply of and demand for funds, this implication is difficult to accept. Second, an assumption underlying the expectations theory is that lenders and borrowers have no preference between long- and short-term securities; they would just as soon lend or borrow for short terms to maturity as for long terms to maturity. The implication that long- and short-term securities are close substitutes for one another has been questioned in light of observations suggesting that (1) many lenders have a preference for liquidity and thus prefer to hold short-term financial claims, which are usually more liquid than long-term financial claims; (2) many borrowers would prefer to issue long-term claims, thereby avoiding the need to issue and reissue short-term claims; and (3) short- and long-term borrowers have different purposes, such as borrowing for inventory versus borrowing for capital expenditures.

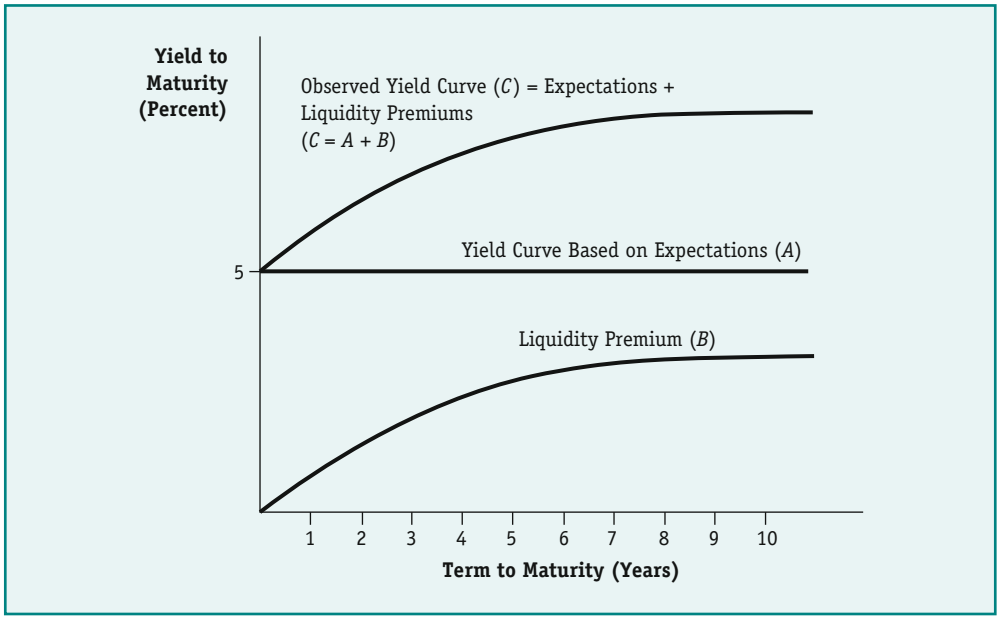
The question then is how does the expectations theory need to be modified in view of these observations? There is little doubt that many borrowers and lenders have preferred maturities, or what have come to be called **preferred habitats,** and that this creates a degree of segmentation between the short-term and long-term markets. Nevertheless, abundant evidence exists to support the proposition that the short- and long-term markets are not watertight compartments. More specifically, research suggests that investors, for example, are willing to switch preferred habitats from short-term financial claims to longer-term claims if a bonus or "sweetener" is associated with doing so. This sweetener or bonus is referred to as a **liquidity premium;** in essence, it is the extra return required to induce lenders to lend long-term rather than short-term. In other words, it is the amount of interest that is required to induce lenders to abandon their preferred habitats. The size of the premium is presumed to rise with the term to maturity; the longer the term, the larger the premium must be to induce lenders to give up their preference for liquidity.[11]

Preferred Habitats
An expectations theory modification hypothesizing that many borrowers and lenders have preferred maturities, which creates a degree of market segmentation between the short-term and long-term markets.

Liquidity Premium
The extra return required to induce lenders to lend long-term rather than short-term.

How the existence of liquidity premiums modifies the expectations theory of the term structure and yield curves can be illustrated with the help of Exhibit 6-6. Suppose the current short rate and expected short rate are both 5 percent. The expectations approach suggests that the yield curve would be flat (curve *A*). However, the preceding discussion suggests that the issuers of long-term bonds have to offer an interest premium to get investors to buy bonds having long-term maturities. The size of the premiums is presumed to rise with the term to maturity. Curve *B* in Exhibit 6-6 shows the size of the liquidity premium at each maturity. Curve *C* represents the yield curve actually observed. The components of the total yield (curve *C*) are the interest rate expectations (curve *A*) and the liquidity premiums (curve *B*).

6-6 The Role of Liquidity Premiums



By way of contrast, note that the expectations approach would explain the shape of the yield curve depicted by curve *C* as indicating that market participants expect rates to rise over time.

So far this discussion has looked at the demand side of the market for securities. But let us not lose sight of the behavior of the suppliers of debt securities (borrowers) implied by this approach. Under normal circumstances, the demand for funds (supply of securities) is usually more fickle than the supply of funds. Changes in the demand for funds, which are driven by expectations, probably account for the largest part of the changes in interest rates. The existence of liquidity premiums means that borrowers are willing to pay them. But why would borrowers be willing to pay more to borrow for longer terms than they expect to pay by borrowing and reborrowing for short terms? Simply put, there is some chance that short rates will be higher in the future than the 5 percent expected rate assumed in our example. If higher-than-expected rates materialize, then borrowing and refinancing in the future would prove to be more expensive than borrowing for a longer term now. Also, the firm could suffer some difficulty in the future, which might reduce its credit rating and make it difficult to acquire funds later. By borrowing long-term, the adverse effects of such problems can be reduced.

In sum, the fact that yield curves have almost always been positively sloped over the past 50 years suggests that liquidity premiums do, in fact, exist. Theoretical considerations on both the supply and the demand side of the securities markets and a variety of empirical studies seem to support such a judgment. Consider again the relatively flat yield curve in May 2007, displayed in Exhibit 6-2. Given the modifications we have just made, it seems reasonable to revise our earlier conclusions based only on the expectations theory. When a liquidity premium is taken into account, it seems reasonable that the relatively flat yield curve of May 2007 may reflect constant or even slightly declining expected future interest rates. Some analysts believe the yield curve could be signaling a recession in the near future and Fed policy that leans towards interest rate decreases.

A Closer Look

The Segmented Market Hypothesis

Under the expectations theory, short- and long-term interest rates adjust until the expected return from holding a series of short-term securities over a certain term to maturity is just equal to the return from holding a long-term security with that same term to maturity. To be more specific, interest rates adjust until the long-term rate is equal to the geometric average of the current short-term rate and the short-term rates expected to prevail over the term to maturity. When full adjustment has occurred, an investor is indifferent between holding a series of short-term securities and holding one long-term security. Hence, the alternatives—holding a series of short-term securities or a long-term security—are perfect substitutes for each other.

The preferred habitat and liquidity premium theories modify this analysis. Under these theories, short- and long-term securities are substitutes for each other, but not perfect substitutes. In general, investors have to receive additional compensation for holding long-term securities that entail less liquidity.

The *segmented market hypothesis* takes the analysis a step further by hypothesizing that short- and long-term securities are not substitutes at all, either perfect or imperfect. Rather, under the segmented market hypothesis, markets for short- and long-term securities are completely separate. Accordingly, interest rates are determined by supply and demand factors in each separate market.

The segmented market hypothesis received renewed interest in 2000 because of the federal government surplus and the behavior of long-term interest rates. After 30 years of deficits, the federal government budget balance went into a surplus position in the late 1990s. (As noted in Chapter 1, the surplus disappeared a few years later after the terrorist attack on September 11, 2001.) During 2000, long-term rates declined much more so than short- and mid-term rates. Analysts hypothesized that this was due to the federal government's use of the government surplus to buy back long-term government securities. As the supply of long-term securities declined, their prices rose and long-term interest rates fell. The federal government was not buying back short- and mid-term securities; consequently, their rates were not affected by the same supply factors. As a result, the yield curve beyond a 10-year term became inverted during this time period.

Our discussion of the determinants of the relationship between short- and long-term interest rates (the term structure) can be easily summarized with the aid of Equation (6-6).

$$i_1 = f(i_s, i_s^e, 1) \tag{6-6}$$

The current long-term interest rate, i_1, is a function of the current short rate, i_s, the short rates expected in the future, i_s^e, and the liquidity premium, 1. The nature

of the relationship between the long rate and each of the determinants is indicated by the sign over each variable. Thus, we would expect long rates to rise if current short rates rise, if expectations about future short rates are revised upward, or if liquidity premiums rise. "A Closer Look" discusses an alternative theory of how the shape and position of the yield curve is determined based on the segmented market hypothesis.

Recap The expectations theory is modified by the fact that lenders may demand a liquidity premium to lend long-term and that borrowers may be willing to pay a liquidity premium to borrow long-term. Also borrowers and lenders may have preferred habitats (preferred maturities) that create a degree of segmentation between the short-term and long-term markets.

THE ROLE OF CREDIT RISK AND TAXES IN INTEREST RATE DIFFERENTIALS

The previous section dealt with interest rates on securities that were alike in every respect except one—term to maturity. Now we will extend our discussion and examine the relationship among interest rates on securities that have the same term to maturity but a different credit risk or taxability.

Credit Risk

Credit Risk
The probability of a debtor not paying the principal and/or the interest due on an outstanding debt.

The term **credit risk** refers to the probability of a debtor not paying the principal and/or the interest due on an outstanding debt. In effect, credit risk is a measure of the creditworthiness of the issuer of a security. Treasury securities are considered to have the least credit risk because they are backed by the federal government. The basic idea here is that in the unlikely event the federal government collapses, we can be reasonably sure the rest of the economy will have collapsed as well. The reverse is not true, because many individual firms can and do fail on a daily basis without the government collapsing. In contrast, corporate and municipal (state and local government) securities are viewed as being risky to some degree and are, therefore, analyzed and rated by firms that specialize in producing credit ratings. The three major credit-rating agencies, **Standard & Poor's, Moody's,** and **Fitch Investors Service,** evaluate a borrower's probability of default and assign the borrower to a particular risk class. With this information, a lender can determine to what degree a borrower will be able to meet debt obligations. Standard & Poor's, Moody's, and Fitch distinguish among several general classes of risk. Exhibit 6-7 reproduces the various credit ratings with a brief description of each. Bonds with below B ratings by the major credit rating services are not recommended for investment and are referred to as high-yield or **junk bonds.** They are highly speculative with regards to whether or not the interest and principal will be paid when due. Thus, because of high credit risk, junk bonds pay a very high yield.

Standard & Poor's, Moody's, and Fitch Investors Service
The three major credit-rating agencies that evaluate a borrower's probability of default and assign the borrower to a particular risk class. Visit their sites at **http://www.stockinfo.standardpoor.com, http://www.moodys.com, and http://www.fitchratings.com.**

Junk Bonds
Highly speculative, high-yield bonds with low credit ratings that are not recommended for investment because of high credit risk.

How are borrowers classified or rated? In the case of business firms, the credit-rating agencies examine the pattern of revenues and costs experienced by a firm, its degree of leverage (dependence on borrowed funds), its past history of debt redemption, and the volatility of the industry, among other things. A firm with a history of strong earnings, low leverage, and prompt debt redemption would get an Aaa rating from Moody and an AAA rating from Standard & Poor's or Fitch. A firm that has experienced net losses, has rising leverage, or has missed some loan payments would get a Baa or lower rating from Moody and a BBB or lower rating from Standard & Poor's and Fitch.

6-7
Credit Ratings

General Description	Standard & Poor's	Moody's	Fitch
Best quality	AAA	Aaa	AAA
High quality	AA	Aa	AA
Higher medium grade	A	A	A
Medium grade	BBB	Baa	BBB
Lower medium grade (speculative)	BB	Ba	BB
Not desirable investment (highly speculative)	B	B	B
Poor standing (high default risk)	CCC	Caa	CCC
Very high default risk	CC, C	Ca	C
(in default)	D	C	DDD, DD, D

The agencies also assign ratings to securities issued by state and local governments. Factors considered here include the tax base, the level of outstanding debt, the current and expected budget situation, and growth in spending.

To see how the credit ratings affect the spread between rates, let us make the reasonable assumption that most potential purchasers of securities would like to be compensated for risk taking. Based on real-world observations, we can say that investors are risk averse and, thus, must be rewarded or compensated with extra interest for accepting more risk. The extra return or interest is called a **risk premium,** and its size increases with the riskiness of the borrower. To illustrate, the prevailing rate on securities issued by borrowers rated Aaa is less than the rate on securities issued by borrowers rated Aa, the second highest rating. The spread between the two rates ($i_{Aa} - i_{Aaa}$) is the premium necessary to induce investors to accept the extra risk associated with Aa-rated securities relative to Aaa-rated securities. Similarly, the rates on Baa-rated securities are higher than the rates on A-rated securities, and so on down the credit ratings shown in Exhibit 6-7.[12]

Risk Premium
The extra return or interest that a lender is compensated with for accepting more risk.

When we plot the spread between the interest rates on securities of the same maturity, but possessing different credit risks, as in Exhibit 6-8, which depicts the spread between Baa-rated and Aaa-rated municipal bonds, we find that the spread varies over time as the perceived credit risks among the securities change. For example, if a default occurs in a major market, many investors may perceive lower-rated bonds as relatively more risky and respond by selling lower-rated issues and purchasing higher-rated issues. This movement to higher-rated securities is usually referred to as a "flight to quality." Put another way, if investors perceive that relative risks have changed, they will demand different risk premiums, and thus the rate spread among securities will change.

Taxability

The last major factor influencing the structure of interest rates is the taxability of securities. As you may know, interest income earned from securities issued by state and local governments is exempt from federal income tax, while interest earned from corporate securities is taxed at the same rates as other ordinary income.[13]

Marginal Tax Rate
The tax rate that is paid on the last dollar of income that the taxpayer earns.

The **marginal tax rate** is the rate paid on the last dollar of income the taxpayer earns. Because the United States has a progressive tax rate structure, higher rates apply to additional income earned beyond given tax rate brackets. Income under the bracket

6-8
The Spread between Baa Rated and Aaa Rated Municipal Bonds from 1980–2008

limits is taxed at lower rates. Interest income from bonds is additional income and is therefore taxed at the highest marginal rate that the taxpayer falls into. For bondholders who do not have much other income, interest income is taxed at a lower marginal rate than for bondholders whose other income puts them into a higher marginal tax bracket. This means, for example, that if you are in the 33 percent marginal federal income tax bracket, a 4 percent interest rate on a municipal bond is just as attractive as a 6 percent interest rate on, say, a taxable corporate bond; after taxes, both yield 4 percent.[14]

As we shall see, the tax-exempt status of municipal bonds makes them quite attractive to taxpayers in high marginal tax brackets. Financial intermediaries such as commercial banks and casualty insurance companies, which are subject to the 38 percent marginal corporate income tax rate, have traditionally been heavy purchasers of municipal securities.[15]

To see how the yields on municipals are related to the yields on other types of securities, the following simple equation is helpful.

$$\text{after-tax yield} = i - it = i(1 - t) \tag{6-7}$$

where t = the marginal tax rate on interest income.

This says that the after-tax yield on a bond is equal to the interest rate earned, i, minus the portion that is taxed away, it; put another way, the after-tax yield is equal to the portion of the interest earned that is not taxed away: $i(1 - t)$.

Just as we care about our after-tax, take-home pay, rather than our before-tax gross pay, financial investors making portfolio decisions care about—and therefore compare—the after-tax returns on securities they might acquire. To see how this matters, suppose the rate on AAA-rated corporate bonds is 6 percent and the marginal tax rate of buyers is 33 percent, meaning that one-third of the interest income earned will be taxed away. If the only difference between the corporate bonds and AAA-rated municipal bonds is that the interest on corporate bonds is taxable while the interest on the municipal bonds is not ($t = 0$ percent), we would expect buyers to prefer the municipal securities to the corporate bonds as long as the rate on municipal bonds exceeds 4 percent.

If the yield on municipal bonds equals 4 percent, investors in the 33 percent marginal tax bracket will be indifferent because the corporate bond yields 4 percent [6 percent – (.33 × 6 percent) = 4 percent] after taxes. What if the marginal tax rate of buyers of municipal securities is only 20 percent? What yield on municipal bonds would leave investors in the 20 percent tax bracket indifferent between our 6 percent corporate bond and a municipal bond? The answer is 4.8 percent.[16]

In general, we would expect the buying and selling by investors—more formally, the substitution among securities—to result in the yield on municipals being approximately equal to the yield on similarly rated taxable securities, such as corporate bonds, minus the portion of the yield that is taxed away. Close the book for a moment and see if you can explain why. Suppose, for example, that the interest rate on municipals is above the after-tax yield on corporates for the typical investor; municipals are obviously the more attractive security. The resulting purchase of municipals and sale of corporates will raise the prices and lower the yields on municipals and lower the prices and raise the yields on corporates. In this example, the effect of the substitution toward municipals and away from corporates will be to equalize the interest rate on municipal securities with the after-tax return on similarly rated corporate securities.

We now know that the marginal tax rate that investors pay on interest income is the key to understanding the spread between the interest rates on tax-exempt municipal securities and the interest rates on taxable securities. We can also see that taxpayers, depending on their individual incomes, are in different marginal tax brackets, some high and some low. Thus, there is an **average marginal tax rate** somewhere between the high and the low marginal tax brackets. Because of substitution, the interest rate on municipal securities will gravitate to the rate that makes the "average" taxpayer (in the average marginal tax bracket) indifferent between municipals and similarly rated corporate securities.[17]

Average Marginal Tax Rate
The average of the marginal tax rates of all taxpayers.

But why are those in high tax brackets, such as banks and rich individuals, especially attracted to municipals? Simply put, they are subject to a tax rate above the average marginal rate. To see precisely how this matters, assume that the average marginal tax rate is 20 percent, the rate on municipals is 4.8 percent, and the rate on corporates is 6 percent. The average investor—that is, the investor in the 20 percent marginal tax bracket—is indifferent between the two securities; both have an after-tax return of 4.8 percent. Not so the investor in a higher marginal tax bracket. Someone in the 33 percent marginal tax bracket, for example, would prefer the 4.8 percent return on the municipal security to the 4 percent after-tax return on the corporate security.

Recap Other factors that affect the interest rates on different securities with the same maturity are credit risk and taxability of interest income. Taxpayers in marginal tax brackets above the average marginal tax bracket are particularly attracted to tax-exempt securities.

A final example shows how both credit risk and taxability play a part in determining yield to maturity. Under normal circumstances, yields on 20-year general obligation AAA-rated municipal bonds are less than 80 percent of yields on comparable Treasury securities. The yield spread mainly reflects the difference in the credit risk and the tax status accorded the earnings of the two assets. In December 1994, affluent Orange County, California, declared bankruptcy due to bond market losses in its investment pool. The bankruptcy created widespread uncertainty in the municipal bond market and the perception of greater risk. By year's end, the municipal bond market had gone into a tailspin, and according to *Business Week*, "municipal bonds [were] trading at yields unusu-

ally close to those on Treasury bonds, so after-tax yields for many long-term muni buyers [were] roughly one-third higher."[18] Although the tax status had not changed, the relative credit risk had, causing the spread between the two categories of securities to narrow. Buyers of municipal bonds demanded a larger risk premium, and as the after-tax yields reflect, they received it.

To sum up, the yields on municipal securities are typically, but not always, well below the yields on other securities with similar credit ratings and similar terms to maturity. The interest rate differentials observed are a reflection of the different tax treatment accorded the interest earned on each type of security and the different credit risk.

Summary of Major Points

1. The yield curve is a graphical representation of the relationship between interest rates (yields) on a particular security and its term to maturity. It is a visual depiction of the term structure of interest rates. A unique yield curve exists for each type of financial asset, such as government securities and corporate bonds, among others.
2. The most widely accepted explanation for the shape (slope) and position (level) of the yield curve is the expectations theory.
3. The expectations theory postulates that the long-term rate is the geometric average of the current short-term rate and the short-term rates expected to prevail over the term to maturity of the long-term security. The geometric average is the appropriate average to use in explaining the expectations theory because it takes into account the effects of compounding. The interest earned during the first year earns interest during the second year.
4. According to the expectations theory, the slope of the yield curve depends on the interest rates expected to prevail on short-term securities in the future. More specifically, a positively sloped yield curve reflects expectations of a rise in future short-term rates, relative to current short-term rates; a negatively sloped yield curve reflects expectations of a fall in future short-term rates, relative to current short-term rates.
5. Expectations about future short-term rates depend on expectations about future income, the money supply, and inflation. As expectations about these variables change, expected short-term rates will change, resulting in a change in the slope and level of the yield curve.
6. The fact that yield curves have almost always been upward sloping and that some borrowers and lenders appear to have preferred habitats has led to the view that the expectations theory is an incomplete explanation of the term structure of interest rates. Accordingly, the expectations theory has been modified to include and take into account term or liquidity premiums—the sweetener or bonus (extra return) needed to induce investors to acquire longer-term financial claims. In general, long-term rates will be determined by current short-term rates, expected short-term rates, and liquidity premiums.
7. *Credit risk* refers to the probability of a debtor defaulting—that is, not paying the principal or interest due on an outstanding debt. Standard & Poor's, Moody's, and Fitch—the three major credit-rating agencies—evaluate a borrower's probability of default and assign the borrower a risk classification.
8. Because investors are risk averse, they must be offered the bonus of extra interest to accept more risk. The extra return or interest is called a *risk premium*, and its size increases with the riskiness of the borrower.
9. Financial investors care about the after-tax return on their investments. Because the interest earned on municipal securities is exempt from the federal income tax, the yields on municipal securities are typically well below the yields on other (taxable) securities with similar credit ratings and similar terms to maturity.

Key Terms

Average Marginal Tax Rate, p. **130**
Credit Risk, p. **127**
Expectations Theory, p. **116**
Fitch Investors Service, p. **127**
Geometric Average, p. **117**
Junk Bonds, p. **127**
Liquidity Premium, p. **124**
Marginal Tax Rate, p. **128**
Moody's Investors Service, p. **127**
Preferred Habitats, p. **124**
Risk Premium, p. **128**
Standard & Poor's Investors Service, p. **127**
Term Structure of Interest Rates, p. **114**
Treasury Notes, p. **114**
Yield Curve, p. **114**

Review Questions

1. Discuss the factors that determine the shape and level of a yield curve. How do term to maturity, credit risk, and tax treatment affect the interest rate on a particular asset?
2. Explain why a yield curve can be negatively sloped. Would interest rates be abnormally high or low? What would be the overall expectation of the direction of future short-term interest rates?
3. According to the expectations theory, how is the long-term interest rate determined? Why is the geometric average used instead of the simpler arithmetic average?
4. BBB-rated corporate bonds are riskier than AAA-rated bonds. Explain where the two yield curves will lie relative to each other. What could cause the spread to widen?
5. What determines expectations? Are expectations about future prices independent of expectations about future money supply growth rates? Why or why not?
6. Could the yield curve for municipals ever lie above the yield curve for government securities? (*Hint*: Consider all tax rates.) What effect would an increase in marginal tax rates have on the position of the yield curve for municipals?
7. Use the liquidity premium to give an explanation for why yield curves have most often been upward sloping over the past 50 years. Could a yield curve be upward sloping even if short-term rates were expected to remain constant? If interest rates are expected to fall dramatically, under what conditions would the yield curve still be upward sloping?
8. Define *preferred habitats*. Explain how this modification affects the expectations theory. What could cause market segmentation based on preferred habitats to break down? How is the market segmentation hypothesis different from the expectations theory?
9. Discuss the following statements: Over a typical cycle, the movement of the yield curve is like the wagging of a dog's tail. The entire tail wags, but short-term rates wag more often than long-term rates.
10. If yield curves became flatter (steeper), what does this say about expectations of future interest rates?
11. What would happen to the risk premium if the economy went into a strong expansion? A deep recession?

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

✓12. If the current short-term rate is 5 percent and the expected short-term rate is 8 percent, what is the long-term interest rate? (Use the expectations theory.)

✓13. If the current short-term rate is 5 percent and the current long-term rate is 4 percent, what is the expected short-term interest rate? (Use the expectations theory.)

✓14. Rework questions 12 and 13 assuming that there is no compounding. (*Hint*: Use the simple arithmetic average instead of the geometric average.)

✓15. Assume that current interest rates on government securities are as follows: one-year rate, 5 percent; two-year rate, 6 percent; three-year rate, 6.5 percent; four-year rate, 7 percent. Graph the yield curve.

16. Given the yield curve in question 15, what is the expected direction of future one-year rates? Under what circumstances would one-year rates be expected to decline?

✓17. If a taxpayer's marginal tax rate is 33 percent, what is the after-tax yield on a corporate bond that pays 5 percent interest? If the average marginal tax rate of all taxpayers is 50 percent, will the taxpayer with the 33 percent marginal tax rate prefer a corporate or a municipal security? Assume equivalent safety and maturity.

✓18. Gather data from *The Wall Street Journal* on interest rates for today's government securities of various maturities. Graph the yield curve. (*Hint*: Check your answer by looking at the yield curve for Treasury securities that the *Journal* publishes daily in its Part C.)

19. What would happen to interest rates on municipal securities, given each of the following scenarios?
    a. The government increases marginal tax rates.
    b. The tax exemption on municipals is eliminated.
    c. Corporate profits fall severely.
    d. The federal government guarantees that the interest and principal on corporate bonds will be paid.
    e. A broader secondary market for government agency securities develops.

✓20. Draw the yield curve assuming that future short-term rates are expected to remain constant and the liquidity premium is positive. Now assume that net lenders increase their preference for short-term securities. Show what happens to the yield curve.

Suggested Readings

For information on current daily yields and yield curves on government securities, go to **http://www.ustreas.gov/offices/domestic-finance/debt-management/interest-rate/yield.html.**

Read about "The Living Yield Curve" on the Web at **http://www.smartmoney.com/onebond/index.cfm?story=yieldcurve&nav=dropTab.** This article analyzes normal, steep, inverted, and humped yield curves and allows you to compare yield curves on various dates.

For an interesting discussion of many issues touched on in this chapter, see the "Economic Outlook for the United States," remarks by Vice Chairman Roger W. Ferguson, Jr., at the Howard University Economics Forum, Washington, DC, March 3, 2006, at **www.federalreserve.gov/boarddocs/speeches/2006/20060303/default.htm.**

For a highly academic paper on yield curves, see "The Yield Curve and Predicting Recessions," by Jonathan H. Wright, *Finance and Economic Discussion Series: 2006–07*, Federal Reserve Board, February 2006, at **www.federalreserve.gov/pubs/feds/2006/200607/index.html.**

For a readable survey article on the yield curve by Tao Wu, see, "What Makes the Yield Curve Move" in the *Federal Reserve Bank of San Francisco Economic Letter*, No. 2003–15, June 6, 2003.

For a challenging and comprehensive book about the yield curve, see Moohrad Choudry, *Analysing and Interpreting the Yield Curve* (Singapore: John Wiley & Sons, 2004).

For an article that looks at the relationship between the slope of the yield curve and economic activity and inflation, see Arturo Estrella, Anthony P. Rodrigues, and Sebastian Schich, "How Stable Is the Predictive Power of the Yield Curve: Evidence from Germany and the United States," *Staff Reports*, No. 113, Federal Reserve Bank of New York (September 2000).

For an article that looks at measuring the yield curve, see Brian Sack, "Using Treasury STRIPS to Measure the Yield Curve," *Finance and Economics Discussion Series No. 2000–42*, Board of Governors of the Federal Reserve System (2000).

"Admiring Those Shapely Curves: The Gap Between Short-Term and Long-Term Interest Rates" is an article about how the shape of the yield curve can predict future economic growth. It can be found in *The Economist* (April 4, 1998): 83.

Many of the conclusions arrived at in this chapter are discussed in Burton Malkiel, *The Term Structure of Interest Rates* (Princeton, NJ: Princeton University Press, 1966).

Endnotes

1. Treasury bonds have an original maturity greater than 10 years. At the present time, the longest maturity of a newly issued fixed-rate Treasury security is 30 years. The Treasury now issues 5-, 10-, and 20-year inflation-indexed bonds with rates that vary with inflation.
2. Later in the chapter, we modify the analysis to account for differences in liquidity between short- and long-term financial securities.
3. For simplicity, we are assuming that the short-term rate does not change. In reality, because the demand for short-term securities increases, their price would rise. The portfolio reshuffling would result in a fall in the short rate in addition to a rise in the long rate.
4. Equation (6-2) is easily generalized for a long-term security, with, say, 10 years to maturity. In this case, the 10-year rate would be the geometric average of the current short-term one-year rate and the one-year rates expected to prevail over the next nine years. Thus, $i_{10} = [(1+i_1)(1+i_1^e)(1+i_2^e) \ldots (1+i_9^e)]^{1/10} - 1$, where i_n^e is the expected one-year rate n years from now.
5. For simplicity, we are ignoring the fact that the supply of short-term securities will also be reduced, causing their price to rise and their yield to fall.
6. Using the expectations theory to solve for the expected future short-term rate on January 29, 1993, we get 5.08 percent: $[(1 + .0424)^2/(1 + .0341)] - 1 = .0508$. Solving for the expected future short-term rate on June 1, 2003, we get 1.45 percent because $[(1 + .0123)^2/(1 + .0101)] - 1 = .0145$. Solving for the expected future short-term rate on May 7, 2007, we get 4.44 percent because $[(1+.0468)2/(1+.0492)] - 1 = .0444$.
7. Remember that this equation is a reduced-form equation derived from simultaneously solving a demand and supply equation for loanable funds.
8. An even deeper question is what determines Y^e, M^e, and p^e. A theory of how expectations are formed is covered in the next chapter.
9. In reality, the Fed may not put on the brakes until the economy is well into the recovery phase!
10. Note that negatively sloped yield curves have also been associated with abnormally high levels of interest rates when most market makers expect future interest rates to be lower. This was particularly true in 1981.
11. Of course, the lender who goes into the short-term market also faces the risk that interest rates could fall more than expected or rise less than expected. In this case, the lender would have been better off lending long. This is called the *reinvestment risk*. In general, it is believed that the liquidity premium outweighs the reinvestment risk.
12. For simplicity's sake, we have used Moody's ratings in this example. We could just as easily have used Standard & Poor's or Fitch's ratings.
13. In many states, interest on bonds issued by the investor's home state is also exempt from state income taxes. For example, California residents do not pay state income taxes on interest earned on bonds issued by California, but they do pay state income taxes on interest earned on bonds issued by Arizona. Although subject to federal income taxes, interest earned on federal government securities is exempt from state and local income taxes.
14. For simplicity's sake, we are assuming equivalent safety and maturity.
15. Commercial banks often feel subtle pressure to purchase the securities issued by municipalities in the immediate geographical area. With the bank's deposits coming from the local citizens, such purchases are viewed as an investment in the community the bank serves, an investment that demonstrates the goodwill and intentions of the bank.
16. 4.8 percent = 6 percent – (.20 × 6 percent).

17. Note that in actuality the yields on municipal securities are somewhat higher than one would expect after taking account of the average tax rate of all buyers. For the most part, the quality of the secondary market in municipal issues is not as good as the secondary market for Treasuries and many corporate issues. As a result, municipal securities possess somewhat less liquidity than other types of securities, and therefore the liquidity premium demanded by investors is larger on municipals than on other types of securities.
18. *Business Week* (December 26, 1994): 140.

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CHAPTER SEVEN

7

Water seeks its own level.

Market Efficiency and the Flow of Funds Among Sectors

Learning Objectives

After reading this chapter, you should know:

How prices of different financial instruments are related

How expectations are formed

The difference between rational expectations and adaptive expectations

What the efficient markets hypothesis is and how it relates all financial prices

What the flow of funds among sectors is and how the flow of funds is affected when financial prices change

"STOCK PRICES RISE OVER 28 PERCENT WHILE BOND PRICES RISE OVER 9 PERCENT"

This was a typical newspaper headline reporting changes in financial prices during 2003. It is not always the case, however, that stock and bond prices move in these directions and by these magnitudes. For instance, in 2002, the headline would have read: "Stock Prices Fall over 20 Percent While Bond Prices Rise over 15 Percent." Other years are different—as different as day and night. The purpose of this chapter is simply to answer the question: Can these price movements among financial instruments be explained?

In the last chapter, we saw the important role that expectations play in determining bond prices. Expectations of GDP, money, and inflation affect expected interest rates, which then feed into actual interest rates and bond prices. In this chapter, we shall also see that expectations affect prices of all financial instruments. Because of their important role, economists have spent a great deal of time and energy in developing various theories of how expectations are formed by market participants.

We divide this chapter into three parts:

- First, we identify the relationship between bond prices and the prices of other financial instruments such as stocks or mortgages. You shall see that prices of all financial instruments adjust so that expected rates of return on all financial instruments are equalized after adjustments for varying degrees of risk and liquidity have been made.[1] Again, expectations play a central role.
- Second, recognizing the important role of expectations, we develop the theories of adaptive and rational expectations.
- Third, we take the analysis of how market participants form expectations one step further by developing the efficient markets hypothesis, which is based on the theory of rational expectations as applied to financial markets. We conclude that after full adjustment has occurred, prices of financial instruments are equal to their expected values, which equal the optimal forecasts of those variables given all available information.

Hopefully, the analysis will go a long way toward answering the question, "Can these price movements among financial instruments be explained?" found in the first paragraph of this chapter. We begin our discussion by relating expected rates of return to the prices of long-term financial instruments.

HOW EXPECTED RATES OF RETURN AFFECT THE PRICES OF STOCKS AND BONDS

Stocks and bonds are two major, long-term financial instruments. Stocks represent ownership of part of the issuing firm, whereas bonds represent debt of the issuer, whether it is a firm, government entity, or other net borrower. To streamline the analysis, we focus on how stock and bond prices are related while recognizing that the analysis could easily be extended to other long-term financial instruments such as mortgages.

A *portfolio* usually consists of many financial instruments, including both stocks and bonds. Market participants hold combinations of various financial assets rather than one asset to take advantage of gains from diversification. **Diversification** is the allocation of surplus funds to a variety of financial instruments instead of holding just one asset. As a famous saying in the world of finance goes, "Don't put all your eggs in one basket." Returns to holding two different assets may be positively or negatively correlated. Returns are positively (directly) correlated if they tend to move up or down

Diversification
The allocation of surplus funds to more than one financial instrument in order to reduce risk.

The Benefits of Diversification

Assume there are two stocks with returns that are perfectly inversely (negatively) correlated. When the price of one increases by a certain percent, the price of the other decreases by the same percent. For example, SwimmingPools, Inc., pays a 16 percent return each year when temperatures are above average and zero percent in other years. SkiResorts, Inc., pays a 16 percent return each year when temperatures are below average and zero percent in other years. Assuming that half the time the temperatures are above average and half the time they are below average (a reasonable assumption given the nature of averages!), the expected return to holding either stock is 8 percent. If an investor chooses to hold one or the other, but not both, the expected return will be 8 percent, but the risk involves the fact that the return will fluctuate between either 0 or 16 percent. As the following table illustrates, smart investors will split their surplus funds equally between SwimmingPools and SkiResorts and earn an 8 percent return all of the time, thus eliminating all risk!

The expected return to owning a share of shock is the sum of each possible outcome multiplied by the probability of that outcome.

Stock	(a) Possible Outcomes	(b) Probability	(a) × (b)
SwimmingPools, Inc.			
(above average temps)	16%	.50	8%
(below average temps)	0%	.50	0
Expected return to owners	-	-	8
Return fluctuates between 0% and 16%			
SkiResorts, Inc.			
(above average temps)	0%	.50	0%
(below average temps)	16%	.50	8
Expected return to owners	-	-	8
Return fluctuates between 0% and 16%			

If an investor's surplus funds are split between SwimmingPools and SkiResorts, when temperatures are above average, half of the portfolio (the half invested in SwimmingPools) will earn 16 percent and half (the half invested in SkiResorts) will earn zero percent. As noted above, the expected return is the sum of the possible outcomes multiplied by their probabilities. In this case, the overall portfolio will earn 8 percent ($.16 \times .5 + 0 \times .5 = .08$). The reverse is true for below-average temperatures, with SkiResorts earning 16 percent and SwimmingPools earning zero percent. Again, the portfolio split between the two firms earns 8 percent. Thus, the risk or the fluctuation of returns between zero and 16 percent has virtually been eliminated by diversification, or owning both companies. The portfolio earns 8 percent when temperatures are above average and 8 percent when temperatures are below average. Risk has been

eliminated because the returns to the two assets were perfectly inversely correlated. In the real world, few assets exhibit this property. It is also true that returns are usually not perfectly positively (directly) correlated, meaning that the prices of two stocks usually do not always change by the exact same percent. If stock prices are perfectly correlated, risk is not reduced by diversification. In the case in which returns are correlated (either directly or inversely), but not perfectly so, risk can be reduced (although not eliminated as in the case of perfect inverse correlation) through diversification.

Thus, we can conclude the following:

- If returns to two assets held are perfectly negatively correlated, risk can be eliminated through diversification.
- If returns to two assets held are perfectly positively correlated, risk can *not* be reduced through diversification.
- If returns to two assets held are positively or negatively correlated, risk can be reduced for any given expected return but not eliminated through diversification.

together. For instance, if, as the economy improves, two stocks also tend to improve, and vice versa, they are positively correlated. Note that the price of one stock may be increasing 6 percent while the other is increasing 2 percent but that they are still positively correlated even though the magnitude of the increase is different. To be positively correlated, the only thing that matters is that the change to each be in the same direction.

Returns are negatively (inversely) correlated if the return on one asset increases while the return on the other tends to decrease. To be negatively correlated, the only thing that matters is that the change to each be in the opposite direction. Some financial instruments do better in recessions, while most perform better in expansions. Returns on financial instruments that improve over the business cycle are negatively correlated with those that lose value. As long as returns among financial instruments are not perfectly correlated (that is, they do not change by the same magnitude and direction all the time), then the risk or fluctuation of a combination or basket of assets with a given expected return will be less than the risk for any one asset with the same expected return. Thus, one can earn a higher return for any level of risk or be exposed to less risk for any given return by diversifying. Now would be a good time to read "A Closer Look" on p. 139 to learn more about the benefits of diversification.

Assuming that an individual opts for a portfolio of various financial instruments with different risks and returns, how would you go about managing such a portfolio? More specifically, how would you decide whether to purchase and hold stocks or bonds or some combination of both, and so on? We hope that you would compare the expected rates of return on the different types of financial assets, selecting those with the highest expected return consistent with the risk you are willing to take, while realizing that by diversifying you can improve the expected performance or reduce the risk of your portfolio.

Stocks

The size of a shareholder's ownership position depends on the number of stock shares owned. For example, if 1,000 shares are outstanding, a stockholder who owns 100 shares in effect owns 10 percent of the firm. The value of each share—and, therefore, the value of the stockholder's holdings in the corporation—depends on the prevailing price of the firm's stock. If, for example, the stock's price is $50 per share, the total value of the stockholder's 100 shares is $5,000, and the total value of the firm is $50,000 ($50×1,000 shares). If the stock price rises to $60 per share, then the value of the stockholder's 100 shares increases to $6,000 and the value of the firm increases to $60,000. Likewise, given an unforeseen fall in the stock's price to $40 per share, the values of the stockholder's shares and the firm decrease to $4,000 and $40,000, respectively. The key question, then, is, What determines the price per share?

Outstanding shares of stocks of publicly held companies are traded (bought and sold) on organized exchanges such as the New York Stock Exchange or by networks of brokers and dealers around the country. (More on this in Chapter 13.) Stock prices fluctuate daily, some going up, some going down, as financial investors buy and sell shares of various corporations. In part, those fluctuations occur because a share of stock represents a claim on the earnings of a firm. Tangible evidence of this sharing of earnings comes in the form of dividends, which are a distribution of profits to stockholders. If earnings prospects are improving, the share price and dividend paid per share may also be rising.[2] Financial investors will be attracted by the improved outlook (profitability) for the firm.

In general, as current and expected future earnings rise, stock prices also rise, and as current and prospective earnings decline, stock prices also decline. A growing economy means that sales, production, and incomes are expanding, while a declining economy means the opposite. Because expected earnings also rise when the economy is expected to grow and tend to fall when the economy is expected to contract, there is often a positive correlation between the growth of real national income and stock prices.[3]

What is the expected return on stocks? Generally speaking, the expected return on a share of stock, say, over a year, is the expected dividend plus the expected change in the price of the stock, all divided by the share price at the time of purchase. For example, if you pay $50 a share, the expected dividend is $1 per share, and you expect the price to rise $3 over the year, the expected return is 8 percent [($1+$3)/$50=.08=8 percent].[4] An 8 percent expected return would also result if the expected dividend is $4 and the expected capital gain is $0 because [($4+$0)/$50=.08=8 percent]. Now would be a good time to look at Exhibit 7-1, which examines this relationship.

Bonds

With regard to bonds, the expected return to a newly issued bond is the current interest rate. Recall from Chapter 5 that bonds represent long-term debt and pay a fixed annual coupon payment.[5] The coupon payment is the product of the face value of the bond multiplied by the coupon rate. Bondholders are entitled to be paid the coupon payment before dividends are paid to stockholders. The coupon rate is the interest rate at the time the bond is originally issued and usually appears on the bond itself. The coupon rate is not the same thing as the current interest rate if interest rates have changed since the bond was issued.

For example, if the face value of a bond is $1,000 and the coupon rate is 6 percent, then the coupon payment is $60, since $60 divided by $1,000 is equal to 6 percent

7-1
The Expected Return to Owning Stock

Expected Dividend	Expected Price Change [Capital Gain (+) or Loss (–)]	Expected Return
$3	–$2	($3+(–$2))/$50=2 percent
$3	$0	($3+$0)/$50=6 percent
$3	$2	($3+$2)/$50=10 percent
$3	$4	($3+$4)/$50=14 percent
$4	–$2	($4+(–$2))/$50=4 percent
$4	$0	($4+$0)/$50=8 percent
$4	$2	($4+$2)/$50=12 percent
$4	$4	($4+$4)/$50=16 percent

As the body of the text explains, the expected return of owning a share of stock for, say, one year is the expected dividend plus the expected capital gain or loss, divided by the share price at the time of purchase. Thus, when either factor changes, the expected return will change.

Assume that the stock originally costs $50 per share. The preceding table shows the rate of return for owning the stock given various expected dividends and expected price changes (the capital gains or losses).

If actual dividends or actual capital gains and losses turn out to be different from those expected, the actual return will be different from the expected. Needless to say, all investors hope that actual dividends and capital gains turn out to be higher than expected rather than the reverse.

($60 / $1,000 = .06). This coupon payment does not change even if interest rates change after the bond has been issued. However, the bond's price will change whenever interest rates change or if the issuer's ability to make the agreed-upon interest or principal payments comes into question.

As portrayed in Exhibit 7-2, the expected return on previously issued bonds is the coupon rate plus the expected percentage change in the bond's price over the course of the year.

Let's assume that you purchase a $1,000 newly issued 30-year bond described above with a 6 percent coupon rate. One year after the bond is issued, interest rates fall to 4 percent. The price of the bond with 29 years to maturity would increase to $1,339.67, because the present value of the 29 coupon payments of $60 plus the present value of the repayment of the $1,000 principle at maturity would equal $1,339.67.[6] In other words, as you saw in Chapter 5, prices of previously issued bonds adjust so that they pay the new prevailing interest rate. The expected return on the bond is equal to the coupon rate (6 percent) plus the expected percentage capital gain from the change in interest rates. In our example, the new interest rate is 4 percent, and the expected percentage capital gain is 34 percent [($1,339.67 – $1,000) / $1,000 = .34 = 34 percent]. Thus, the expected return to owning the bond over the year is the coupon rate (6 percent) plus the expected percentage capital gain (34 percent), or 40 percent.

To see how bond prices fit into the picture, assume that the current interest rate on bonds is 6 percent and that the expected return on stocks is 8 percent, with the typical stock costing $50 and the expected dividend equal to $4. We also assume for simplicity that (1) the expected capital gain is zero, (2) stocks and bonds have the same degree of liquidity,[7] (3) stocks are riskier than bonds, and (4) the portfolio managers must be

7-2
The Expected Return on Bonds

Expected Percentage Return on Bonds

= Coupon rate + Expected percentage change in the bond price
= (coupon payment/bond price at the beginning of the year) + (expected bond price at the end of the year – bond price at the beginning of the year)/bond price at the beginning of the year)

compensated 2 percent for the additional risks of owning stocks. Under these conditions, when bonds pay a 6 percent return and stocks pay an 8 percent return, the typical portfolio manager is indifferent between stocks and bonds. He or she will presumably hold some of each because the risk-adjusted returns are equalized. Equation (7-1) depicts this situation:

(7-1) Risk-adjusted return on stocks = risk-adjusted return on bonds
Nominal return on stocks – compensation for higher risk of owing stocks
= risk-adjusted return on bonds (8 percent – 2 percent) = 6 percent

Now suppose that the Fed decides to pursue a more expansionary monetary policy. The initial result of this is a decline in the interest rate on bonds to 4 percent and a reduction in the risk-adjusted return on bonds from 6 percent to 4 percent.[8] The fall in the interest rate will tend to raise stock prices through two channels.

First, the expected return on bonds is now below the risk-adjusted expected return on stocks. Given the substitutability of stocks for bonds in investors' portfolios and the higher expected return on stocks, the demand for stocks will rise, tending to raise stock prices. Within the confines of our simple example, we can even say how high stock prices will rise: stock prices will rise until the expected return on stocks is again 2 percent higher than the expected return on bonds (4 percent). This will occur when the price of our typical share of stock rises to $66.67, because the $4 expected dividend divided by $66.67 equals 6 percent ($4/$66.67 = .06).

Second, the fall in the interest rate will be expected to raise the demand for goods and services and increase the sales and earnings of firms. With earnings expected to rise, dividends will also be expected to rise. This reinforces the first effect. For example, if the dividend is expected to rise to $5 per share, then financial investors will be willing to bid up the price per share even further to $83.33 because $5 divided by $83.33 is equal to 6 percent ($5 / $83.33 = .06 = 6 percent).[9] Again, after stock prices have adjusted to the change in interest rates, the risk-adjusted return on stocks will be equal to the risk-adjusted return on bonds.[10]

Assuming that you and other portfolio managers would like to have owned the stock before all of this occurred, you can see now why actual and expected changes in the interest rate get so much attention in the stock market.

In the real world, many types of long-term financial instruments offer varying degrees of risk and liquidity. Because of the substitutability of various financial instruments, prices of financial instruments will adjust so that returns to owning different instruments are equalized after adjustments have been made for differences in risk and liquidity. In other words, in financial markets, risk- and liquidity-adjusted rates of return are equalized.

Recap Prices of long-term financial instruments change as current and future expected earnings change. If interest rates fall, prices of previously issued bonds rise, and vice versa. If current and expected future earnings rise, ceteris paribus, stock prices also rise, and vice versa. In managing a portfolio, market participants compare expected rates of return and select those financial assets with the highest expected return consistent with varying degrees of risk and liquidity. As long as returns among various financial instruments are not perfectly correlated, diversification reduces risk for any given expected return. Stock and bond prices adjust until the portfolio manager is indifferent between stocks and bonds. If interest rates change, ceteris paribus, stock prices also change. When full adjustment has occurred, differences in returns on various financial instruments reflect differences in only risk and liquidity.

To reiterate, it is the expected return on bonds and the expected return on stocks that determine stock and bond prices. It should not surprise you that this is true of all financial instruments. Because expectations play such a central role, we turn now to a general theory of how price expectations are formed, which will then be applied to financial instruments.

The Formation of Price Expectations

The substantial research on the formation of price expectations suggests that the following factors are important in shaping the public's expectations of future prices as suggested in Equation (7-2):

$$\text{Price expectations} = f(\text{current and past prices, expected change in national income, and expected changes in production costs}) \quad (7\text{-}2)$$

This equation suggests that the formation of price expectations is both backward and forward looking. The idea that price expectations depend on the public's experience with prices, as reflected in current and past prices, is the backward-looking component. Expectations formed by looking back are typically called **adaptive expectations.** This experience is measured as a weighted average of past values because the recent past (say, the last one to two years) is likely to be more influential in forming expectations about the future than the more distant past. Thus, recent years are weighted more heavily than earlier years. For example, if the rate of inflation were 3 percent per year for 10 years and rose to 4 percent in the most recent two years, then the public will probably expect inflation in the coming year to be closer to 4 percent than to 3 percent.

Adaptive Expectations
Expectations formed by looking back at past values of a variable.

It is unreasonable to believe that the public will take only the past into consideration when anticipating future prices. Thus, expected changes in costs of production and in national income also contribute to the formation of price expectations. For example, will the price of oil rise or fall? If the public expects a large rise in the price of oil, government expenditures, or bank reserves in the coming year, expectations of inflation may be raised to, say, 5 percent. Expectations formed by looking both backward and forward, using all available information, are typically called **rational expectations.** Exhibit 7-3 highlights the relationship between adaptive and rational expectations.

Rational Expectations
Expectations formed by looking both backward and forward.

The **theory of rational expectations** states that, on average, expectations of financial prices will be equal to the optimal forecast. The **optimal forecast** is the best guess possible, arrived at by using all available information both from the past and about the future. Even if a forecast is rational, there is no guarantee that the forecast will be accurate. All that is necessary is that, *on average*, the forecast be equal to the optimal forecast. There is an aspect of randomness in financial markets that, more often than not, makes the forecast either a little short or a little wide of the mark. Thus, the forecast

Theory of Rational Expectations
The theory that expectations will, on average, be equal to the optimal forecast.

Optimal Forecast
The best guess possible arrived at by using all of the available information.

7-3 Adaptive and Rational Expectations

Adaptive Expectations	Rational Expectations
Expectations formed as a weighted average of past values	Expectations formed by looking at all available information
Usually more weight is given to more recent values of the variable	Looks at the past as well as all additional available information, such as information about expected changes in national income and costs
Backward looking	Backward and forward looking

error (the difference between the actual value and the forecast) will *on average* be zero. In any given time period, it is impossible to predict what the forecast error will be.

There is another reason besides randomness that the optimal forecast may deviate from what turns out to be the actual value of the forecasted variable: there may be one or more additional key factors that are relevant but not available at the time the optimal forecast is made. If the information is not available, then the forecast may be inaccurate. However, it is still rational because the decision maker makes use of all available information. This is different from the situation where market participants fail to use all available information because they are unaware of it or because it is too costly to do so. In this latter case, expectations formed in this manner are neither accurate nor rational.

The reasoning behind the rational expectations theory is that it is costly for market participants *not* to use all available information in forming price expectations. For example, if a producer ignores readily available information that interest rates are going up based on a change in Fed policy, then it may produce too much output, ignoring the effects that the interest rate hikes have on demand. Thus, the producer earns less profit than it otherwise would have. Or if a producer ignores the effect of higher oil prices on demand and costs, it may again produce more than the profit-maximizing output. In such cases, the errors are costly to management, employees, and stockholders and give a strong incentive to consider readily available information in the future.

An implication of rational expectations is that as new information becomes available, market participants should adjust expectations accordingly. The weight of current research on the formation of price expectations suggests that the public does not adjust its expectations instantaneously when new information becomes available. There are lags between the time that information becomes available and when it is fully incorporated into expectations. However, the evidence also suggests that as market participants (the public) have come to better understand the process of inflation, the lag in adjusting expectations has shortened considerably. Indeed, in recent years, the Fed has become more open about its policy stance; this is partly because the Fed believes that its policy will be more effective if market participants better understand what the Fed is doing and what it perceives about the future direction of the economy.

Another implication of rational expectations is that if there is a change in the way a variable moves, the way in which expectations of the variable are formed will also change. An example will help to clarify. In the early 1980s, changes in the monetary aggregate M2 were highly correlated with changes in national income. Therefore, changes in M2 played a major role in forming expectations about changes in national income. Since the late 1980s, changes in national income have not been highly correlated with changes in M2. Therefore, changes in M2 will not be given a large weight in forming expectations about changes in national income.

Recap Adaptive expectations are formed by looking at current and past prices. Rational expectations are formed by looking at past prices and at all currently available information about the economy that may affect prices. The theory of rational expectations is that expectations of financial prices will be equal to optional forecasts, which are the best guesses possible, arrived at by using all available information. Because of randomness in financial markets, the actual value of a financial variable is usually different from the optimal forecast. However, the forecast error (the difference between the actual value of the variable and the optimal forecast) will on average be zero.

The Efficient Markets Hypothesis: Rational Expectations Applied to Financial Markets

Efficient Markets Hypothesis
This hypothesis states that when financial markets are in equilibrium, the prices of financial instruments reflect all readily available information.

The **efficient markets hypothesis** builds on the theory of rational expectations. Namely, when financial markets are in equilibrium, the prices of financial instruments reflect all readily available information. Financial markets are in equilibrium when the quantity demanded of any security is equal to the quantity supplied of that security. Returns reflect only differences in risk and liquidity. As in all markets, prices—in this case, prices of financial instruments—adjust to bring financial markets to equilibrium. In an efficient market, the optimal forecast of a security's price (made by using all available information) will be equal to the equilibrium price.

Let's assume that there is a financial instrument, say a share of stock, with an equilibrium return of 10 percent after adjusting for risk and liquidity. The stock clearly offers some combination of more risk and/or less liquidity than another financial asset whose equilibrium return is less than 10 percent. The dollar return in a given time period is equal to the price of the stock at the end of the time period minus the price at the beginning of the time period plus any dividend payment made during the time period. To express this return as a percentage, we need to divide the total return by the price at the beginning of the period, as in Equation (7-3), to get

$$R = (P_{t+1} - P_t + D)/P_t \tag{7-3}$$

where
R = percentage return over the time period,
P_{t+1} = price of the stock at the end of the time period,
P_t = price of the stock at the beginning of the time period, and
D = dividend payments made during the time period.

If at the beginning of the time period we know the price and dividend payment of the stock, then the only unknown variable is the price of the instrument at the end of the time period (P_{t+1}). The efficient markets hypothesis assumes that expectations of future prices of financial instruments are rational. This is equivalent to assuming that the expected or forecasted price of the stock at the end of the time period will be equal to the optimal forecast of that variable arrived at by using all available information. Thus, if expectations are rational, the expected return on the stock will be equal to the optimal forecast arrived at by plugging in the optimal forecast for P_{t+1} into Equation (7-3).

Returning to our example, let's assume that company A announces new profit numbers that raise the expected price of the instrument at the end of the time period. The question is, How will today's price respond to the new higher expected price in the future? Assuming that the risk and liquidity of the financial asset have not changed and that the equilibrium return (based on that risk and liquidity) of A is 10 percent, the present price will adjust so that, given the new expected price, the return will still be 10 per-

cent. Thus, the conclusion is that the current price will rise to a level where the optimal forecast of an instrument's return is equal to the instrument's equilibrium return.

To clarify, let's assume that the original price and expected price of A was $100 and that the dividend was $10. Using Equation (7-3), the original return would be 10 percent, which we assumed, given the risk and liquidity of A, was also the equilibrium return. Let's assume that based on the new higher profit numbers, the expected price increases to $115.[11] What will happen to the current price? Based upon our analysis, the current price should rise to a point where the expected return on A remains at its equilibrium return of 10 percent. In this case, we solve for the new current price based on an expected future price of $115 and a dividend of $10. Plugging the numbers into Equation (7-3), we get ($115 – P_t + $10)/$P_t$ = .10 or 10 percent. Solving for P_t, we get $113.63. Thus, the current price will immediately rise to $113.63, given the new higher expected price of $115. When the current price is $113.63, the expected return will be equal to 10 percent. At a price lower than $113.63, the expected return would be higher. For example, at the original price of $100, the expected return would be 25 percent ($115 – $100 + $10)/$100 = 25 percent). Funds would flow in this market by investors seeking the higher than equilibrium return of 15 percent based on risk and liquidity. As funds flowed in, the price of A would rise. Funds would keep flowing into the market, pushing the price up until the market returned to equilibrium. This occurs at a price of $113.63 because ($115 – $113.63 + $10)/$113.063 = 10 percent.

Two points are worth emphasizing. First, the equilibrium return is based on the risks and liquidity of this financial instrument relative to other financial instruments. Note that we are assuming that the risk and liquidity of A have not changed so that the equilibrium return to A relative to the risk and liquidity of other financial instruments is 10 percent. Second, *current* prices adjust whenever new information becomes available that changes current expectations about *future* prices.

The rationale behind the efficient markets hypothesis is straightforward. Namely, if current prices do not fully reflect any changes in expectations, then some market participants will earn less than what they otherwise would have. There will be unexploited opportunities to gain by purchasing those financial instruments that pay a return above equilibrium. The drive for profits ensures that all opportunities for profit will be exhausted and that prices of all financial instruments will adjust to the equilibrium return, which is the optimal forecast. Now would be a good time to read the "A Closer Look" on p. 148 about the implications of the efficient markets hypothesis.

Stronger Version of the Efficient Markets Hypothesis
The theory that the prices of all financial instruments not only reflect the optimal forecast of the financial instrument but also the true fundamental value of the instrument.

Market Fundamentals
Factors that have a direct effect on future income streams of the instruments, including the value of the assets and the expected income streams of those assets on which the financial instruments represent claims.

The efficient markets hypothesis holds that the prices of all financial instruments are based on the optimal forecast obtained by using all available information. A **stronger version of the efficient markets hypothesis** holds that the prices of all financial instruments reflect the true fundamental value of the instruments. Thus, not only do prices reflect all available information, but this information is accurate, complete, understood by all, and reflects the market fundamentals. **Market fundamentals** are factors that have a direct effect on future income streams of the instruments. These factors include the value of the assets and the expected income streams of those assets on which the financial instruments represent claims. Thus, if markets are efficient, prices are correct in that they represent underlying fundamentals. In the less-stringent version of the hypothesis, the prices of all financial instruments do not necessarily represent the fundamental value of the instrument.

There have been extraordinary run-ups and collapses of stock or bond prices, known as bubbles, that do not seem to be related to market fundamentals. Such run-ups in stock prices occurred in Japan in the late 1980s and more recently in the United States in the late 1990s. Some economists point out that bubbles in financial markets can still be explained by rational expectations. It may be rational to buy a share of

Implications of the Efficient Markets Hypothesis

The efficient markets hypothesis is attractive from an intuitive sense. However, for most investors who want to believe they can consistently get above average returns, it is unattractive. The implications are that a hot tip will not pan out unless it is based on information not readily available; however, buying and selling stocks based on "insider" information (information available only to someone within the corporation) is illegal.

One implication of the efficient markets hypothesis is that prices of financial instruments reflect all readily available information. Thus, if information about an issuer is already expected, when an announcement of the information is made, the announcement will have little or no effect on the instrument's price. For example, if it is believed that the bankruptcy of a firm is eminent, prices of the stocks and bonds of the failing company will fall even before the actual bankruptcy is declared. Thus, prices of financial instruments change dramatically only when "unexpected information" becomes available.

Another implication of the efficient markets hypothesis is that it is impossible to beat the market (earn an above average return). This is so because current prices of financial instruments reflect the optimal forecast using all available information when markets are in equilibrium. If I read a favorable earnings report in the Sunday newspaper, by the time I buy the instrument on Monday morning, its price will already have adjusted so that I will not earn an above average return.

Whatever the available information, markets are always moving toward an equilibrium of sorts, which can mean moving toward or away from previous equilibriums as factors affecting supply and demand for securities or funds change. A market is really not efficient unless the available information is understood by significant participants. A learning curve exists in understanding, adapting to, and using information that is not equally shared, understood, or held with great and unvarying confidence, and this information is subject to imminent change; hence, volatility in the market is to be expected and may even be greater (1) the more information becomes available and (2) the faster it is disseminated.

The quality of information varies, and when traders are not sure of what they know or don't know, the market can be volatile even without any changes in the available information as confidence levels rise and fall. Add to this the rational or irrational emotions embodied in herd instinct, market momentum, market rotation, guru hypnosis, mythical mottos such as "buy on the rumor, sell on the fact," consensus forecasts, and so on. In areas of the market such as high tech stocks in the late 1990s and early 2000s, it is unlikely that participants interpreted the available information the same way.

With increased individual control over pension plans and the rise of managed mutual funds, individuals are now participants in the stock and bond markets more so than in the past. Many make little use of information except for minimal asset allocation based on the reputation of a popular guru or fund manager. Fund managers consequently engage in highly competitive behavior to report good earnings results.

Powerful mood swings of pessimism and optimism can by contagion sweep the markets and become part of the changing information that affects them.

For each person beating the average, someone is always being beaten by it. Whether someone can *consistently* beat the average is the question. John Maynard Keynes, the well-known economist, said that the true genius is the person who can accurately forecast what the average investor will believe about the direction of the economy or the future profitability of a corporation. In reality, forecasting what the average investor will believe is more important than forecasting what will actually happen.

One final note: When interest rates change, default risk also changes. For example, if the Fed takes action to increase interest rates, the economy slows and the risk of a default increases as the economy slows. Thus, the future income stream from the financial asset becomes less certain. This, in turn, affects both the risk premium that the lender will require and the price of the financial instrument.

stock at a high price if it is thought that there will be other investors in the future who would be willing to pay inflated prices (prices that exceed those based on market fundamentals) for the stock. This phenomenon is sometimes called "the greater fool" theory. Following this train of thought, subsequent collapses in stock prices occurred in Japan in the 1990s and in the United States in the early 2000s.

Other economists suspect that financial market prices may overreact before reaching equilibrium when there is a change in either supply or demand. That is, prices may rise or fall (overshoot or undershoot) more than market fundamentals would justify before settling down to the price based on fundamentals. In these cases, it may be possible for investors to earn above average returns or to experience above average losses.

Recap

The efficient markets hypothesis states that when financial markets are in equilibrium, the prices of all financial instruments reflect all readily available information. Prices of financial instruments are based on optimal forecasts. The rationale behind the hypothesis is that if prices do not reflect all available information, there will be unexploited profit opportunities. A stronger version of the efficient markets hypothesis holds that prices of financial instruments represent underlying or fundamental values of the assets and the expected income streams of those assets on which the financial instruments represent claims. Bubbles in financial markets where prices seem to exceed fundamental values can be rational if investors believe that other investors will buy the financial instrument at still higher prices. Some believe that financial prices overreact (overshoot or undershoot) in response to newly available information.

So far we have seen that according to the efficient markets hypothesis, financial prices adjust so that unexploited opportunities for profit are eliminated, and financial markets are in equilibrium when the prices of financial instruments are based on optimal forecasts using all available information. In equilibrium, differences in rates of return on financial instruments are based on differences in risk and liquidity. In the next section, we will take a broader look at the flow of funds among sectors such as the household, business, government, rest-of-the-world and financial sectors of the economy. We shall see that there are considerable links between the responses of spending units to changes in prices of financial instruments and the flow of funds among sectors.

Flow of Funds
A social accounting system that divides the economy into a number of sectors including the household, business, government, foreign, and financial sectors.

Sources and Uses of Funds Statement
A statement showing the sources and uses of funds for any sector.

Sources of Funds
For any sector, income and borrowing.

Uses of Funds
For any sector, current spending and changes in financial instruments held.

Surplus Sector
A sector where the combined surpluses of the lenders are greater than the combined deficits of the net borrowers.

Deficit Sector
A sector where the combined deficits of net borrowers are greater than the combined surpluses of the net lenders.

THE FLOW OF FUNDS AMONG SECTORS

The **flow of funds** is a social accounting system that divides the economy into a number of sectors and constructs a **sources and uses of funds statement** for each sector. The purpose of this section is to discuss the financial flows of funds among sectors and their relationship to the economy. We then construct a hypothetical sources and uses of funds table for the U.S. economy.

The four main sectors are the household, business, government, and rest-of-the-world sectors.[12] For any sector, the **sources of funds** are current income and borrowing. The **uses of funds** are current spending and changes in financial instruments held. Any sector is composed of spending units with surpluses (net lenders) and spending units with deficits (net borrowers). For any sector, the combined surpluses of the net lenders may be greater than the combined deficits of the net borrowers. In this case, the sector would be a **surplus sector.** If the combined deficits of the net borrowers are greater than the combined surpluses of the net lenders, then the sector is a **deficit sector.**

For *all* sectors combined, however, borrowing (the issuance of financial claims) must be equal to lending (the acquisition of financial assets). This is so because each financial claim, in turn, implies the existence of a complementary financial asset. However, in each individual sector, it is highly unlikely that the combined surpluses just equal the combined deficits. Thus, the economy is usually composed of surplus and deficit sectors where the combined surpluses of the surplus sectors is equal to the combined deficits of the deficit sectors for the economy as a whole. Exhibit 7-4 fleshes out these relationships.

Although the flow-of-funds accounts divide the economy into nine sectors, in Exhibit 7-5 we simplify to the household, business, government, and rest-of-the-world sectors. By adding a fifth sector, the financial sector, along with the others, we can see how intermediation facilitates the flows of funds from the surplus to the deficit sectors and vice versa. Note that for every use of funds, whether for acquiring financial assets or spending on goods and services, there must be a source, and every source is put to some

7-4
Surplus and Deficit Sectors

A Surplus Sector

The combined surpluses of all spending units in the sector > the combined deficits of all spending units in the sector

A Deficit Sector

The combined surpluses of all spending units in the sector < the combined deficits of all spending units in the sector

For All Sectors

The combined surpluses of the surplus sectors must equal the combined deficits of the deficit sectors

For example, if the household and business sectors are deficit sectors and the government and the rest-of-the-world sectors are surplus sectors, then the combined deficits of the household and business sectors must equal the combined surpluses of the government and rest-of-the-world sectors.

Likewise, if the business and government sectors are deficit sectors, and the household and rest-of-the-world sectors are surplus sectors, then the combined deficits must equal the combined surpluses.

7-5

A Hypothetical Sources and Uses of Funds Statement for the U.S. Economy (in Billions of Dollars)

Sources of Funds	Uses of Funds
Households	
Disposable income: $8,200	Consumption spending on non-durables, durables, and services: $8,100
Net borrowing: $275	Investment spending on real assets: $375
Deficit = $275	
Business Firms	
Net revenues: $1,060	Net spending on real assets (plant and equipment): $1,225
Net borrowing: $220	Net spending on real assets (inventories): $55
Deficit = $220	
Government	
Tax receipts: $3,300	Government spending on goods and services: $1,190
	Government spending on transfer payments: $1,620
	Interest payments on the national debt: $260
	Surplus: $230
Rest-of-the-World	
Foreign purchases of U.S. goods and services: $1,170	U.S. purchases of foreign goods and services: $1,470
Net foreign purchase of U.S. financial assets: $805	Net U.S. purchases of foreign financial assets: $240
	Surplus = $265
Financial Intermediaries	
Net acquiring of financial assets: $1,080	Net incurring of financial liabilities: $1,080

The financial sector, composed of financial intermediaries, is included to show the extent of financial intermediation in the economy. Financial intermediaries acquire funds to lend by issuing claims on themselves. They use the funds to purchase financial instruments issued by borrowers. As you may have guessed, the extent of financial intermediation in an economy has a direct relationship on the extent of economic development.

use (if not spending on goods and services, then in acquiring financial instruments). Consequently, total sources and uses of funds are not only equal in each sector but also in the aggregate for all sectors taken together. Furthermore, the uses of funds by any one sector are the sources of funds for other sectors and vice versa.

For example, the sources for households are income and debt; for business firms, net revenues and borrowings; and for the government, taxes or borrowing. Likewise, each sector has two major uses for funds. Households use funds for spending on consumption and investment or for acquiring financial assets; firms use funds for investment or for acquiring financial assets; the government uses funds for government expenditures or for acquiring financial assets; and the rest-of-the-world sector uses funds to purchase U.S. goods or services or to invest in U.S. securities. The numbers we use in Exhibit 7-5 are hypothetical. As can be seen, the surpluses of the rest-of-the-world and household sectors exactly offset the deficits of the business and government sectors.

Looking Back

The Historical Pattern of Surplus and Deficit Sectors

Historically, the household sector was consistently a surplus sector. However, a relatively large surplus fell consistently in the early 1990s and became a deficit in 1997. After a small surplus in 1998, the household sector continuously ran a deficit through 2007.

The nonfinancial business sector has consistently been a deficit sector with the exception of a few years in the early and mid–1990s. The business sector ran a deficit over $850 billion in 2007, about $370 billion in 2008, and it appears that it will also run a significant, albeit smaller deficit in 2009. It is expected that in future years it will invariably remain a deficit sector.

The government sector was a deficit sector in almost all of the years from 1960 through 1997. During the first quarter of 1998, the combined federal, state, and local government budgets were in surplus for the first time since 1969. However, the surplus years for the government sector were short-lived. By 2001, the government was again a deficit sector. Partially due to the financial crisis, large deficits loom on the horizon.

Since 1982, the rest-of-the-world sector has also been a surplus sector. In the 1990s, the surplus of the rest-of-the-world sector increased from $100 billion in 1992 to $263.6 billion in 1997 to $442 billion in 2000 and to $854.5 billion in 2007.

The format in Exhibit 7-5 allows us to analyze flows of funds among sectors, how those flows are intermediated, and how the Fed can monitor and influence them. During expansions, both income and interest rates normally rise along with the relative intentions to deficit spend. In recessions, the reverse happens. Nevertheless, no sector of the economy can run larger deficits unless other sectors accept larger surpluses.

Recap If the combined surpluses of net lenders are greater than the combined deficits of the net borrowers, then the sector is a surplus sector. If the combined deficits of the net borrowers are greater than the combined surpluses of the net lenders, then the sector is a deficit sector. For all sectors combined, the surpluses must be equal to the deficits.

PULLING IT ALL TOGETHER

In this chapter, we have looked at the efficient markets hypothesis based on the theory of rational expectations. We have seen that prices of financial instruments adjust so that risk- and liquidity-adjusted returns for all financial instruments are equalized. We then looked at the flow of funds among sectors where the combined surpluses of the surplus sectors are just equal to the combined deficits of the deficit sectors.

Let's return to the example discussed earlier of expansionary monetary policy, where the Fed takes action that leads to a fall in interest rates. When this occurs, there is a reshuffling of prices of financial instruments and some spending units decide to spend more in response to the decline in interest rates. Some spending units that were net lenders are enticed to become net borrowers. In the aggregate, the surpluses and

deficits within any sector change so that a sector that was a surplus sector may become a deficit sector, or vice versa. Thus, actions by the Fed not only influence financial prices but also the flow of funds among sectors. The important point is that there are significant linkages between the response of spending units to changes in interest rates and the flow of funds among sectors.

This completes our look at the efficient markets hypothesis and financial prices. We return to stocks and bonds in Chapters 12 and 13. In the next section of the text, we look at the Fed and monetary policy.

Summary of Major Points

1. If returns to various financial assets are not perfectly correlated, holding a portfolio of diversified assets reduces risk for any given expected return or increases expected return for any given level of risk. Thus, investors generally opt for a portfolio of various financial instruments with different risks and returns.
2. Prices of long-term financial instruments such as stocks and bonds change as current and future expected earnings change. If interest rates fall or rise, prices of previously issued bonds rise or fall, respectively. If current and expected future earnings rise, stock prices also rise, and vice versa. Thus, it is the expected return on bonds and the expected return on stocks that determine stock and bond prices.
3. Market participants compare expected rates of return for various financial instruments and select a combination of those with the highest expected return consistent with varying degrees of risk and liquidity. In equilibrium, differences in returns on various financial instruments reflect differences in risk and liquidity only.
4. Adaptive expectations are formed by looking at current and past prices. Rational expectations are formed by looking at past prices and all currently available information about the economy that may affect prices. The theory of rational expectations is that expectations will be equal to optimal forecasts or the best guesses possible based on all available information.
5. The efficient markets hypothesis says that when financial markets are in equilibrium, the prices of all financial instruments reflect all readily available information. The rationale behind the hypothesis is that if prices do not reflect all available information, there will be unexploited profit opportunities.
6. Market fundamentals are factors that have a direct effect on future income streams of financial instruments. A stronger version of the efficient markets hypothesis holds that prices of all financial instruments reflect the true fundamental value of the instrument.
7. The efficient markets hypothesis does not imply that all participants in the market must know the optimal forecast; it is necessary for only a few savvy investors to know the optimal forecast. These savvy investors will then drive the price to the optimal forecast by exploiting opportunities for profit. The efficient markets hypothesis implies that it is impossible to maintain an above average return for a long period of time. Bubbles, investments based on insider information, and market overreaction to new information are exceptions to the efficient markets hypothesis.
8. The flow of funds is a social accounting system that divides the economy into sectors and constructs a sources and uses of funds statement for each sector. For the economy as a whole, the combined surpluses of the surplus sectors must equal the combined deficits of the deficit sectors. When interest rates change, spending changes and some net lenders become net borrowers and vice versa. Thus, when deficits and surpluses for individual spending units change, the flow of funds among sectors is affected.

Key Terms

Adaptive Expectations, p. **144**
Deficit Sector, p. **150**
Diversification, p. **138**
Efficient Markets Hypothesis, p. **146**
Flow of Funds, p. **150**
Market Fundamentals, p. **147**
Optimal Forecast, p. **144**
Rational Expectations, p. **144**
Sources and Uses of Funds Statement, p. **150**
Sources of Funds, p. **150**
Stronger Version of the Efficient Markets Hypothesis, p. **147**
Surplus Sector, p. **150**
Theory of Rational Expectations, p. **144**
Uses of Funds, p. **150**

Review Questions

1. Explain why stock and bond prices adjust until investors are indifferent between stocks and bonds, given varying degrees of risk and liquidity.
2. What is diversification? What is the expected return to a portfolio that is composed of a variety of financial assets?
3. If the returns to two different financial instruments are perfectly positively correlated, can holding a combination of the two reduce risk for any given return? Explain. If the returns to two different financial instruments are perfectly negatively correlated, can holding a combination of the two reduce risk for any given return? Explain.
4. When full adjustment has occurred, what do differences in returns on various financial instruments reflect?
5. If current and expected earnings rise, what happens to stock prices?
6. Interest rates are going up. What happens to the prices of previously issued bonds?
7. How do adaptive expectations differ from rational expectations?
8. Why is the actual value of a financial variable different from the optimal forecast of that variable? Assuming that expectations are rational, what, on average, will be the difference between the actual value and the optimal forecast?
9. What is the efficient markets hypothesis? How does it differ from the stronger version of the hypothesis?
10. What is the fundamental value of a financial instrument?
11. What is the rationale behind the efficient markets hypothesis?
12. Explain why the expected return on newly issued and previously issued bonds is the prevailing interest rate plus any expected capital gain or loss.
13. Must all market participants know the optimal forecast of a financial instrument for the price of the financial instrument to be driven to the optimal forecast?
14. What is a "bubble" in a financial market? Can financial prices ever overshoot or undershoot optimal values?
15. News comes out that leads investors to believe that there is more risk involved with owning financial instrument A. What will happen to its equilibrium return?
16. If the household, business, and government sectors are all deficit sectors, what does this imply about the rest-of-the-world sector?
17. Assume that in 2011, the U.S. government wants to significantly increase the government deficit. What does this imply about the other sectors?

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

✓18. If the current price of a share of stock that pays a $1 dividend is $20, and if the expected capital gain is $2, what is the expected return? What is the return if there is an expected capital loss of $2?

✓19. Assume the equilibrium return on a financial instrument is 10 percent, and the instrument pays no dividends or interest. If the current price is

$100 and the expected future price one year from now just increased from $110 to $120, what will happen to the current price? What if the expected future price decreases from $110 to $100?

✓20. Assume that the equilibrium return on a financial instrument is 10 percent. If the current price is $100 and the instrument does not pay interest or dividend, what is the price expected one year from now when the market is in equilibrium? If the equilibrium return on the instrument increases to 15 percent because the instrument is perceived as more risky, what happens to the current price, assuming the expected price one year from now does not change?

✓21. Assume that HappyDays, Inc., pays an 8 percent return during expansions and a zero percent return during recessions with certainty. SadDays, Inc., pays a zero percent return in expansions and an 8 percent return in recessions with certainty. Show how the fluctuation in return is eliminated if an investor splits his or her surplus funds equally between HappyDays and SadDays.

Suggested Readings

For a look at the historical development of the efficient markets hypothesis, see **http://www.investorhome.com/emh.htm.**

For a discussion of the development of the rational expectations theory, see **http://www.minneapolisfed.org/pubs/ar/ar1977.cfm?js=0.**

Current flow of funds data can be found on the Fed's Web site at **http://www.federalreserve.gov.** They make for interesting analysis because of the sometimes dramatic changes in the flows of funds among sectors.

An analysis of flow of funds data can be found at the Financial Markets Center, **http://www.fmcenter.org.**

For an interesting article about the efficient markets hypothesis, see Justin Fox, "Efficient Markets? Hah!" *Fortune* 139:4 (March 1, 1999).

Robert A. Haugen wrote two interesting books that offer a contrary view: *The Inefficient Stock Market: What Pays Off and Why*, 2nd ed. (Upper Saddle River, NJ Pearson Education, 2002), and *The New Finance: Overreaction, Complexity, and Uniqueness*, 3rd ed. (Upper Saddle River, NJ: Prentice Hall, 2003).

Endnotes

1. Additional factors that can affect the prices of financial instruments are term to maturity, the taxability of earnings, and other supply and demand conditions affecting particular markets. For our purposes here, *term to maturity* is encompassed under risk with, ceteris paribus, longer-term instruments entailing more risk. Also by expected rates of return, we mean *after-tax returns.*
2. If a company pays out only a small portion of its earnings as dividends, then it has retained earnings, which it invests back into the company. Ceteris paribus, this usually leads to higher profits later. If the expected returns from retained earnings exceed the risk-adjusted returns that shareholders could expect to receive on alternative investments made with the dividends, a firm's stock price will rise, and the owner will earn a larger capital gain when the stock is sold. In the 1990s, the trend among many companies was against paying dividends so that profits could be plowed back into the corporation, thus "growing" the corporation. Due to changes in tax laws in the early 2000s that favored dividends over capital gains, the trend has been reversed.
3. Real national income is national income adjusted for changes in price or inflation. For our purposes, real national income is equivalent to real GDP.
4. The specifics of this relationship are fleshed out in Equation (7-3) on page 146.
5. Coupon payments are usually made semiannually. We are assuming annual coupon payments here to simplify. The assumption does not substantively change the results.
6. Hopefully, you recall from Chapter 5 that after bonds are issued, the price of the bond is equal to the present value of the dividend payments and the repayment of principal at maturity.

Thus, $1,339.67 is the present value of the 29 future dividend payments of $60, and the repayment of the $1,000 principle in 29 years. We are assuming that dividends are paid only once a year. If interest rates have fallen, the price of the bond increases. If this bond were a consol, the price of the bond would equal $1,500.

7. If both stocks and bonds have highly developed secondary markets, the assumption that they have the same degree of liquidity is not that unrealistic.
8. As previously noted, the decline in interest rates to 4 percent causes the prices of previously issued bonds to rise so that their risk-adjusted return equals 4 percent instead of 6 percent. Thus, the return on previously issued bonds will equal the return on newly issued bonds.
9. A more formal approach to this relationship between stock prices and interest rates uses the present value (discounting) analysis developed in Chapter 5. Within this framework, the share price is viewed as the discounted present value of a firm's expected earnings (or dividends). Accordingly, a fall in the interest rate and/or a rise in the stream of expected earnings increases the expected value of the firm—that is, the share price—in the market.
10. If the interest rate rises to 8 percent, then, in equilibrium, the risk-adjusted return on stocks will rise to 10 percent, assuming that the typical investor must be compensated 2 percent for the additional risk of owning stocks. The price of a typical share will initially fall to $40 because $4 / $40 = .10 = 10 percent. Assuming the higher interest rate reduces demand and hence earnings, the dividend may be expected to fall to $3. If this is the case, the stock price falls further to $30 because $3 / $30 = .10 = 10 percent.
11. For simplicity's sake, we are assuming that despite the higher profit expectations, the dividend remains the same.
12. Historically, the rest-of-the-world sector has been called the foreign sector. We use the more up-to-date terminology currently used by the Fed.

CHAPTER EIGHT

8

There are three main causes that dispose men to madness: love, ambition, and the study of foreign exchange.

—Walter Leaf, 1926

How Exchange Rates Are Determined

Learning Objectives

After reading this chapter, you should know:

What exchange rates are, and how they affect prices of imports and exports

How exchange rates are determined by supply and demand in the foreign exchange market

The factors that cause exchange rates to change

What the theories of purchasing power parity and interest rate parity are

THE MORE THINGS CHANGE, THE MORE THINGS STAY THE SAME

Throughout the early and mid-1980s, typical headlines in *The Wall Street Journal* told of the strong dollar, its detrimental effects on U.S. jobs, and the eventual efforts to bring down the "overvalued" dollar. By the mid-1990s, the dollar had fallen to record lows against many currencies and was at less than half its mid-1980s value against the Japanese yen. Headlines such as "Dollar Rises in Foreign Exchange Market as U.S. Interest Rates Surge" were replaced with "Dollar Sinks to New Low Against Yen." In the late 1990s, the dollar again strengthened against the yen and other major currencies. In the early 2000s, the dollar was still riding high, particularly against the newly created European Union currency, the euro. The dollar reversed course in early 2002, and except for a brief upturn in 2005, continued to decline in value versus the euro into early 2008. In January 2002, the dollar could purchase 1.17 euros, but by February 2008, it was worth only .68 euros, representing a decline of nearly 42 percent in value versus the euro over this period.

Just what does all of this mean to the average person? How do changes in the international value of the dollar affect job opportunities for recent college graduates and other workers? How are domestic interest rates linked with interest rates in the rest of the world? What happens to imports and exports when the value of the dollar changes? Perhaps most important, how are all of these questions and their answers related? Such questions about the dollar's value are often puzzling to the average person. Many diverse opinions exist about whether a strong dollar is good or bad for the economy, even though the implications of a strong dollar are not often fully understood.

Forty years ago, such questions and the interactions between the U.S. economy and the rest of the world were largely ignored by most bankers, stock market analysts, economists, accountants, corporate treasurers, policy makers—and textbook writers! The reasons were that trading of goods, services, financial securities, and currencies between the United States and other countries accounted for only a small portion of total transactions in the United States and that exchange rates between currencies were fixed by the central banks of the various countries and did not change on a day-to-day basis.

Today, the situation is much different for two simple reasons:

1. Cross-border trading of foreign currencies and financial instruments denominated in various currencies has increased much faster than the more visible explosion of international trade in goods and services.
2. The value of the dollar relative to other currencies changes daily.

Consequently, to ignore the globalization of financial markets in a study of the financial system would be a serious omission.

This chapter focuses directly on exchange rates and their determination. Although exchange rates are intricately linked with national aspects of financial markets, focusing directly on them in this chapter will help clarify the presentation. Throughout this chapter, keep in mind that exchange rates are prices, ultimately determined by forces of supply and demand.

Exchange Rate
The number of units of foreign currency that can be acquired with one unit of domestic money.

Foreign Currency (Money)
Supplies of foreign exchange.

Appreciated
Description of a currency that has increased in value relative to another currency.

DEFINING EXCHANGE RATES

The **exchange rate** is the number of units of **foreign currency (money)** that can be acquired with one unit of domestic money.[1] In other words, the exchange rate specifies the purchasing power of, say, the dollar in terms of how much it can buy of another currency. For example, if the yen/dollar exchange rate is 100 yen, this literally means that $1 will buy 100 yen.[2] If the exchange rate rises to 150 yen, meaning that $1 will now buy 150 yen, then the dollar is said to have **appreciated** relative to the yen. Because it will

Cracking the Code

How Movements in the Exchange Rate Affect the Dollar Price of Foreign Goods

Suppose a Japanese auto costs 2,000,000 yen in Japan. Ignoring transportation costs and the like, what will it cost in the United States? The answer is that the price depends on the exchange rate between the yen and the dollar. The middle row in the following table lists the beginning situation: If the auto costs 2,000,000 yen and $1 buys 100 yen, then as Equation (8-1) indicates, the dollar price will be $20,000 (2,000,000/100).

The top row in the table shows that when the dollar appreciates from 100 yen to 150 yen, the dollar price of the Japanese auto falls to $13,333 (2,000,000/150). In contrast, as illustrated in the third row, a depreciation of the dollar results in a rise in the dollar price of the Japanese auto.

Yen Price of Japanese Auto	Exchange Rate	Dollar Price of Japanese Auto
(1)	(2)	(1)/(2)
2,000,000 yen	$1 = 150 yen	$13,333
2,000,000 yen	$1 = 100 yen	$20,000
2,000,000 yen	$1 = 50 yen	$40,000

Depreciated
Description of a currency that has decreased in value relative to another currency.

Foreign Exchange
Supplies of foreign currencies.

now buy more yen, the dollar's purchasing power has risen. It has grown stronger. On the other hand, if the yen/dollar exchange rate falls from 100 yen to 50 yen, the dollar is said to have **depreciated** relative to the yen. Because it will now buy fewer yen, the dollar's purchasing power has fallen. It has grown weaker. Supplies of foreign currencies are called **foreign exchange.**

So what does all of this have to do with the price a U.S. importer will have to pay for Japanese autos? The following handy formula, linking prices and the exchange rate, provides the ingredients necessary to answer this question:

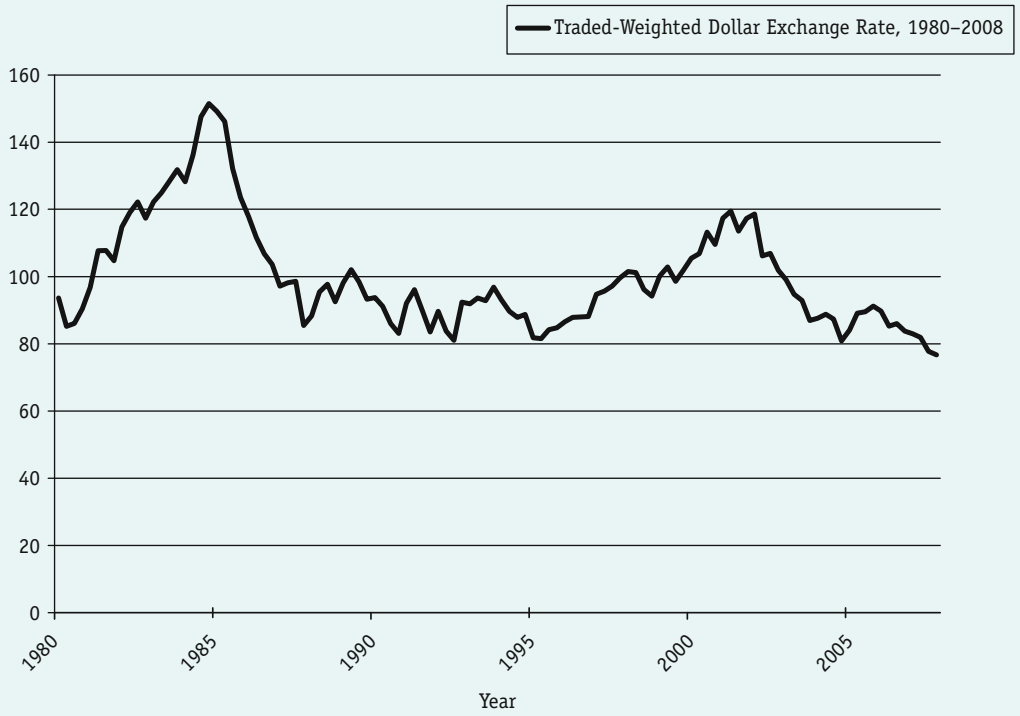
$$\text{U.S. dollar price of foreign goods} = \text{foreign price of foreign goods/exchange rate} \quad (8\text{-}1)$$

It is easy to get things backward. To prevent this, it is useful to consider units. For example, the units in Equation (8-1) are: dollar/good = yen/good ÷ yen/dollar = yen/good × dollar/yen. Note that cancelling yen on the right-hand side leaves the units, dollar/good, the same on both sides.

The accompanying "Cracking the Code" feature uses this formula and the hypothetical figures already mentioned to illustrate the key point of this discussion—the U.S. dollar price of a foreign good is inversely related to the exchange rate. More specifically, as the dollar appreciates, ceteris paribus, the price of foreign goods in the United States falls, even if the foreign price in yen is constant. Conversely, as the dollar depreciates, ceteris paribus, the price of foreign goods in the United States rises.

Needless to say, the importer and its customers (whether they realize it or not) are affected by changes in the exchange rate. More generally, the exchange rate links the domestic and foreign markets for goods, services, and securities. As a result, changes in the exchange rate will have repercussions in all the domestic and foreign markets, including markets for both inputs and outputs. Thus, if the dollar appreciates, ceteris paribus, U.S. imports (which are now relatively cheaper than before) increase, and U.S. exports to foreign countries (which are now relatively more expensive) decrease. As the dollar becomes stronger, ceteris paribus, we lose domestic jobs in both the industries in direct competition with the imports and the industries that end up exporting less. Hopefully,

8-1
The Exchange Rate Since 1980



Includes Switzerland, Germany, Japan, France, United Kingdom, Canada, Italy, Netherlands, Belgium/Luxembourg, Sweden, Spain, Ireland, Finland, Portugal, and Australia.
Source: Global Financial Data, Los Angeles, California.

we have given you some insight into how these fluctuations affect the U.S. economy. Exhibit 8-1 shows the wide fluctuations in the value of the exchange rate since 1980.

To understand these various linkages and repercussions, we must first examine what determines the exchange rate. Simply put, the exchange rate, like all prices, is determined by supply and demand. The United States and the rest of the world trade goods, services, and securities. This trading gives rise to a supply of and demand for the various currencies that are traded in the so-called **foreign exchange market.** More specifically, the supply of dollar-denominated funds comes from the demand by U.S. residents for foreign goods, services, and financial claims during a specific time period; the demand for dollar-denominated funds comes from the demand by foreign residents for U.S. goods, services, and financial claims over a period of time. For simplicity, in the remainder of this chapter, we will follow common usage and use the word *dollars* to represent dollar-denominated funds.[3]

Foreign Exchange Market
The market for buying and selling the different currencies of the world.

Recap The *exchange rate* refers to the number of units of foreign currency that can be acquired with one unit of domestic money. The U.S. dollar price of foreign goods is equal to the foreign price of foreign goods divided by the exchange rate.

Cracking the Code

Finding the Yen/Euro Exchange Rate

If we assume \$1 = 100 yen and \$1 = .8 euros, then 100 yen = .8 euros. We can find how much 1 yen is worth by dividing both sides of the last equation by 100:

100/100 yen	=	.8/100 euros
1 yen	=	0.008 euros

This is the euro/yen exchange rate.

Likewise, we can find out how much 1 euro is worth by dividing both sides of the equation by .8:

.8/.8 euros	=	100/.8 yen
1 euro	=	125 yen

DETERMINING EXCHANGE RATES

To understand how supply, demand, and exchange rates are related, it is best to begin with how the exchange rate between two currencies is determined. The general framework we develop is directly applicable to the more complex relationships among all national currencies. For example, suppose we know the yen/dollar rate is 100 yen and the euro/dollar rate is .8 euros. Then, as demonstrated in "Cracking the Code" (above), it must follow that the euro/yen rate is .008 euros. This "transitivity" allows us to confine our analysis to two monies. We begin by considering how the exchange rate between the U.S. dollar and the Japanese yen is determined, recognizing that our analysis could easily be extended to relationships among more than two currencies. Now would be a good time to look at Exhibit 8-2, which shows some of the basics of foreign exchange markets.

THE DEMAND FOR DOLLARS IN THE FOREIGN EXCHANGE MARKET

The demand for dollars in international financial markets originates from foreign purchases of U.S. goods, services, and securities. Drawing on Exhibit 8-2, we can write:

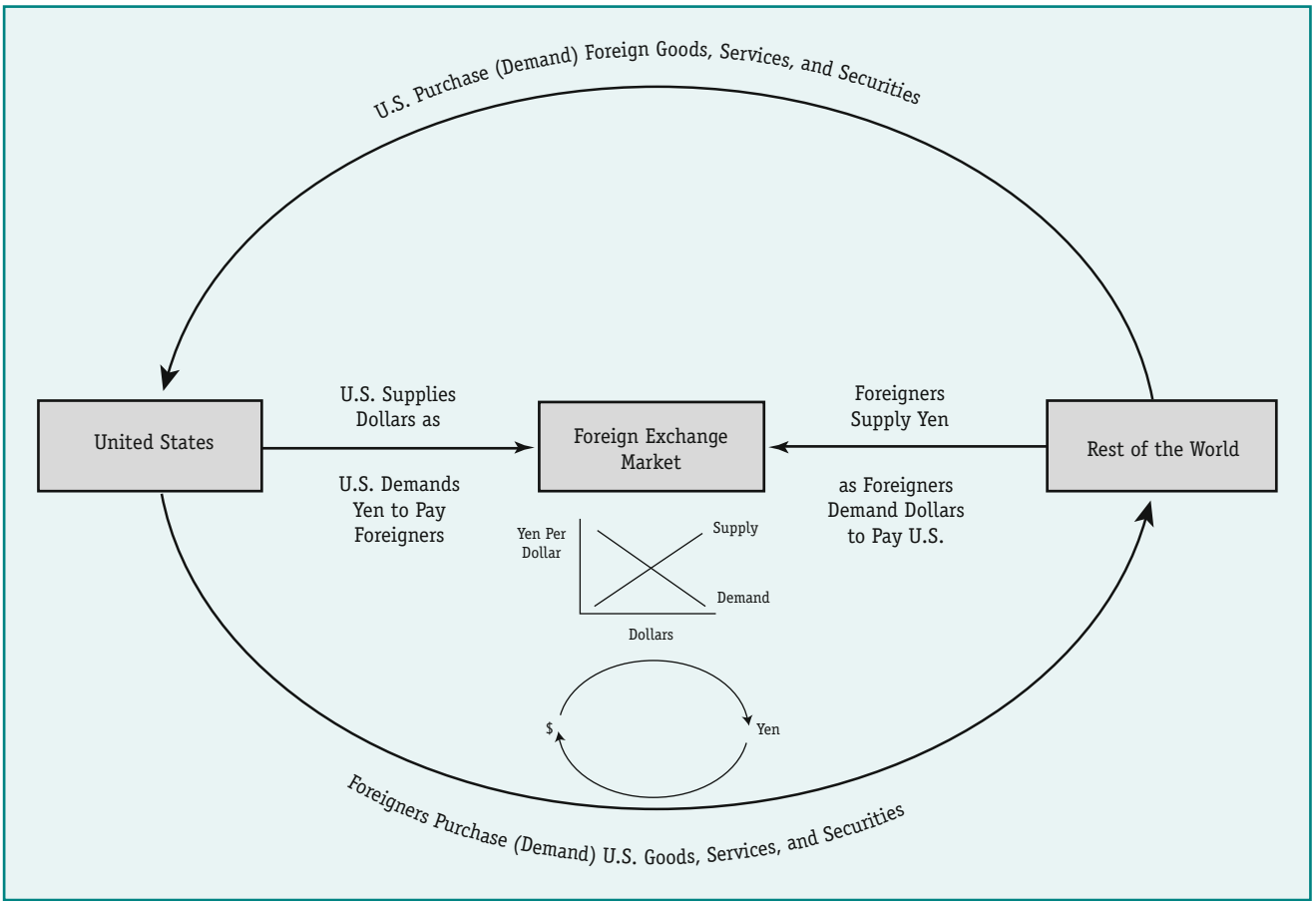
$$\text{Demand for dollars} = f\overset{+}{(}\text{foreign demand for U.S. goods, services, and securities)} \tag{8-2}$$

The plus (+) sign over the expression simply means that the foreign demand for U.S. goods, services, and securities and the demand for dollars are positively related; when the former rises, the latter will also rise. When foreign demand for U.S. goods, services, and securities falls, the demand for dollars falls.

Now consider what happens to the quantity demanded of dollars/month when the exchange rate changes.[4] (Note that the quantity demanded is the amount of dollars that will be demanded at a specific exchange rate, and change in quantity demanded is depicted by movement along the demand curve for dollars.) The answer is that, ceteris paribus, the quantity demanded is inversely related to the exchange rate, as depicted in Equation (8-3):

$$\text{Quantity demanded of dollars/month} = f\overset{-}{(}\text{exchange rate}) \tag{8-3}$$

When the exchange rate goes up so the dollar becomes more expensive, ceteris paribus, the quantity demanded of dollars/month goes down, and vice versa. To see how and why the exchange rate and the quantity demanded of dollars/month are inversely



The foreign exchange market facilitates the trading of goods, services, and financial claims (securities) between countries. This global market is woven together by the market makers in foreign currencies—mostly, the foreign exchange departments of the largest commercial banks located in the world's major financial centers, such as New York, London, Frankfurt, and Tokyo. Without the ability to switch funds back and forth among the world's 100-odd currencies, Americans could not dine in London, sell hot dogs to Japanese tourists, buy imported digital video cameras, or export computers. Furthermore, they could not buy and sell foreign exchange to speculate on future price (exchange rates) movements.

related as shown in this expression, we need to examine how the exchange rate and changes therein affect foreign demand for U.S. goods, services, and securities.

Focusing only on goods to simplify matters, the answer will depend on how the exchange rate affects the prices of U.S. goods in foreign markets—that is, the yen price of U.S. goods in Japan. The following formula provides the key to the entire question:

$$\text{Yen (foreign) price of U.S. goods} = \text{dollar price of U.S. goods} \times \text{exchange rate} \tag{8-4}$$

For example, as in the "Cracking the Code" box on p. 163, if a bushel of U.S. wheat costs $8 in the United States, and the yen/dollar exchange rate is 100 yen—

Cracking the Code

The Cost of a Bushel of U.S. Wheat in Japan

If a bushel of U.S. wheat costs $8 in the U.S. and the yen/dollar exchange rate is 100, then in Japan, assuming purchasing power parity holds, the bushel of wheat will cost 800 yen, calculated as follows:

Dollar price of U.S. goods × exchange rate = yen price of U.S. goods

$8 × 100 yen/dollar = 800 yen

If the dollar appreciates to 150 (implying depreciation of the yen), then a bushel of U.S. wheat will cost 1,200 yen:

$8 × 150 yen/dollar = 1,200 yen

meaning that $1 buys 100 yen or, equivalently, from a foreign perspective, it takes 100 yen to buy $1—the bushel of wheat will cost 800 yen in Japan (8 × 100 yen = 800 yen).

If the dollar appreciates from 100 yen to 150 yen, this would raise the yen price of the bushel of wheat from 800 yen to 1,200 yen (8×150 yen). Following standard tenets of consumer demand theory, we can reasonably assume that foreigners, ceteris paribus, will respond to the price rise by reducing the quantity demanded of U.S. wheat /month (and U.S. goods, more generally), thereby reducing the quantity demanded of dollars/month. Conversely, a depreciation of the dollar, from say, 100 yen to 50 yen, would lower the yen price of the bushel of wheat 800 yen to 400 yen (8 × 50 yen). Again, it is reasonable to assume that foreigners, ceteris paribus, will respond to the fall in the yen price by raising the quantity demanded of U.S. wheat/month (and U.S. goods, more generally), thereby raising the quantity demanded of dollars/month.[5]

To sum up to this point, the minus sign over the exchange rate in Equation (8-3) reflects the fact that, ceteris paribus, an appreciation of the dollar will raise the yen price of U.S. goods in Japan, thereby reducing the quantity demanded of U.S. goods and thus the quantity demanded of dollars/month. The reverse is also true.

Recap The demand for dollars is directly related to foreign demand for U.S. goods, services, and securities. The quantity demanded of dollars/month is inversely related to the exchange rate, ceteris paribus. The foreign price of U.S. goods is equal to the dollar price of U.S. goods times the exchange rate. If the dollar appreciates, the foreign price of U.S. goods increases, ceteris paribus.

THE SUPPLY OF DOLLARS IN THE FOREIGN EXCHANGE MARKET

So much for the demand side—what about supply? In international financial markets, the supply of dollars originates from domestic purchases of foreign goods, services, and financial securities, as depicted in Equation (8-5):

$$\text{Supply of dollars/month} = f\overset{+}{(}\text{U.S. demand for foreign goods, services, and securities}) \tag{8-5}$$

As before, the plus sign over the expression means that U.S. demand for foreign goods, services, and securities and the supply of dollars in the foreign exchange market

are positively related. When the former rises, the latter rises. This occurs because when U.S. demand for foreign goods, services, and securities rises, the demand for yen to pay for those foreign goods, services, and securities also rises. But how do U.S. residents get more yen? The short simple answer is by supplying more dollars! (Remember, dollars are being supplied to purchase yen to purchase foreign goods.) You should be able to explain why a drop in the U.S. demand for foreign goods (in this case, Japanese goods) will lead to a decrease in the supply of dollars.

The next step is to consider how the quantity supplied of dollars/month is affected by changes in the exchange rate. (Note that quantity supplied is the amount of dollars that will be supplied/month at a specific exchange rate.) The answer is that, ceteris paribus, the quantity supplied is directly related to the exchange rate, as shown in Equation (8-6):

$$\text{Quantity supplied of dollars/month} = f(\overset{+}{\text{exchange rate}}) \tag{8-6}$$

To see why the exchange rate and the quantity supplied of dollars/month are positively related, ceteris paribus, consider how changes in the exchange rate affect U.S. demand for foreign goods, services, and securities. Focusing again only on goods for simplicity, we can draw on the "Cracking the Code" feature on p. 163 and the discussion of Equation (8-1). As you saw, the dollar price of foreign goods in the United States is equal to the yen price divided by the exchange rate. Thus, as shown in the feature, as the exchange rate rises, the dollar price of foreign goods falls. Accordingly, we would expect U.S. residents to increase the quantity demanded of foreign goods/month, which, in turn, will raise the quantity of dollars supplied/month to the foreign exchange market, ceteris paribus. Conversely, a fall in the exchange rate will raise the dollar price of foreign goods in the United States, thereby lowering the quantity demanded of foreign goods/month and, thus, the quantity supplied of dollars/month, ceteris paribus.[6]

We have established an inverse relationship between the quantity demanded of dollars/month and the exchange rate, ceteris paribus. In addition, given our assumptions, we have confirmed a direct relationship between the quantity supplied of dollars/month and the exchange rate, ceteris paribus. These relationships are graphed in Exhibit 8-3 on p. xxx, which depicts the determination of the equilibrium exchange rate. The foreign exchange market "clears" at the exchange rate where the demand and supply curves intersect. At this exchange rate, the quantity demanded of dollars/month is equal to the quantity supplied of dollars/month, and we have market equilibrium (at point *A*). At any other exchange rate, there is either a surplus or a shortage of dollars. Market forces generated by the surplus or shortage will cause changes in the exchange rate, which will continue until equilibrium is reached.

Recap The supply of dollars is directly related to U.S. demand for foreign goods, services, and securities. The quantity supplied of dollars/month is directly related to the exchange rate, ceteris paribus. The exchange rate adjusts until the quantity demanded of dollars/month is just equal to the quantity supplied/month in international markets.

We have made a good start, but our ultimate objective is to understand the causes and consequences of changes in the exchange rate resulting from changes in supply or demand. Accordingly, we need to examine the factors that can cause the supply and demand curves for dollars in the foreign exchange market to shift.

Cracking the Code

The Foreign Exchange Market

Suppose that you need pounds for an upcoming trip to England. You call your local bank, say, in Nashville, Tennessee, and place a buy order for 1,000 pounds. Most likely, your local bank does not have a foreign exchange department, so it will call its correspondent bank that specializes in international transactions and place an order for pounds with Citibank's foreign exchange department.[a]

Most foreign currency transactions in the United States are executed by the foreign exchange departments of the largest banks, which are linked via modern telecommunications with foreign exchange dealers around the world. Accustomed to handling transactions from around the globe daily, they stand ready to buy or sell dollars and foreign currencies at the prevailing exchange rate. Acting as auctioneers, they (and other dealers nationwide and worldwide) are prepared to adjust the exchange rate up as buy orders for dollars rise relative to sell orders, or adjust the exchange rate down as buy orders for dollars fall relative to sell orders. Of course, this is just another way of saying that the exchange rate will change as supply and/or demand changes.

So how much will your 1,000 pounds cost? If you could "crack the code" in the relevant table from an online source such as MSN Money, you could figure out the approximate cost. We have reproduced a portion of the foreign exchange table (GBPUS) that appeared on the MSN Money Web site **http://moneycentral.msn.com** on February 25, 2008. It shows the number of dollars required to buy one British pound. The table shows the rate at the end for the trading day, 1.96928, as well as the change.

GBPUS quote; February 25, 2008

1.96928	–.00155	–.08%
Previous Close	1.97083	
Open	1.97006	
Day's High	1.97083	
Day's Low	1.96271	

The first thing to note is this exchange rate is reported in U.S. dollars per British pound. Exchange rates are usually reported in foreign currency required to purchase one dollar—the convention we use throughout this book. To obtain this familiar form, we need to take the reciprocal of dollars per pound to get pounds per dollar: 1/1.96928 = .5078. This implies it takes slightly more than one-half of a pound to purchase one dollar, or equivalently nearly two dollars to purchase one pound.

We can see that the amount of dollars required to purchase one pound decreased from 1.97083 to 1.96928 from the previous trading day's closing to the closing on February 25, a decrease of about .08 percent, (1.96928 – 1.97083)/1.97083 = –.000786 or approximately – .0008. This implies the dollar appreciated and pound depreciated. Similarly, we can calculate the amount of pounds one dollar can purchase and see it increased from .5074 to .5078, unsurprisingly a gain of approximately .08 percent.

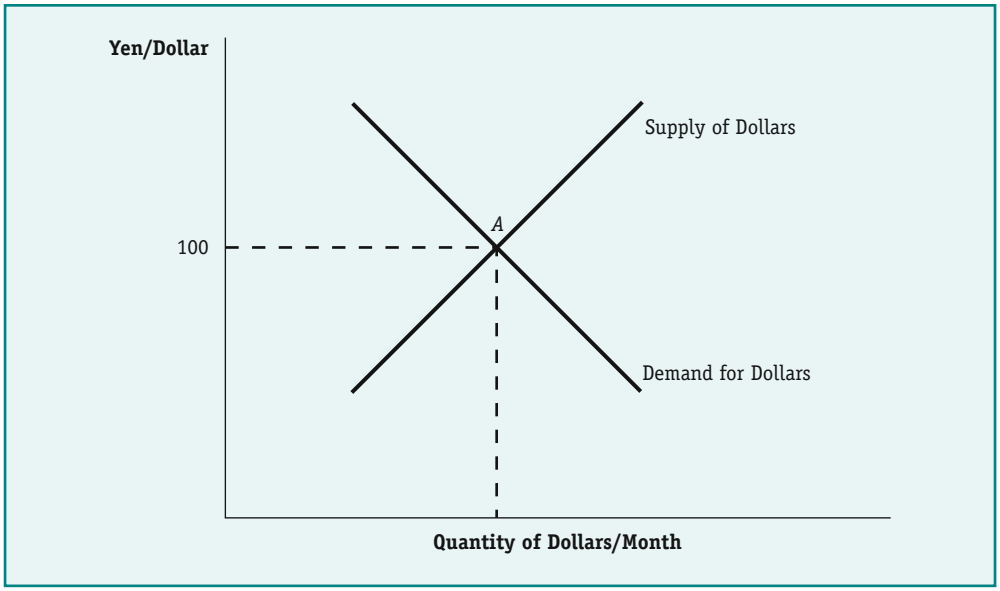
Changes in the exchange rate have profound implications for any transactions between the two currencies. For example, suppose a hotel room in England costs 100 British pounds and this remains unchanged. If the pound/dollar exchange rate falls from .75 pounds/dollar in January, when an American family is planning their trip, to .5 pounds/dollar in July, when they arrive in England, the amount of dollars they must pay for the hotel room increased from $133.33 to $200. Likewise, at the close of business on February 25, 2008, the 1,000 pounds you need to purchase for your trip to London would cost $1000 \times 1.96928 = \$1{,}969.28$.

Endnotes

a. A correspondent bank is merely a large bank, usually located in an important financial center, which provides the smaller bank with various services.

CHANGES IN SUPPLY AND DEMAND AND HOW THEY AFFECT THE EXCHANGE RATE

Starting with supply, let's first consider how and why changes in the supply of dollars in the foreign exchange market affect the exchange rate. The initial question that needs to be addressed is what factors, in addition to the exchange rate, could cause U.S. residents to alter their demand for foreign goods, services, and securities, and thus their supply of



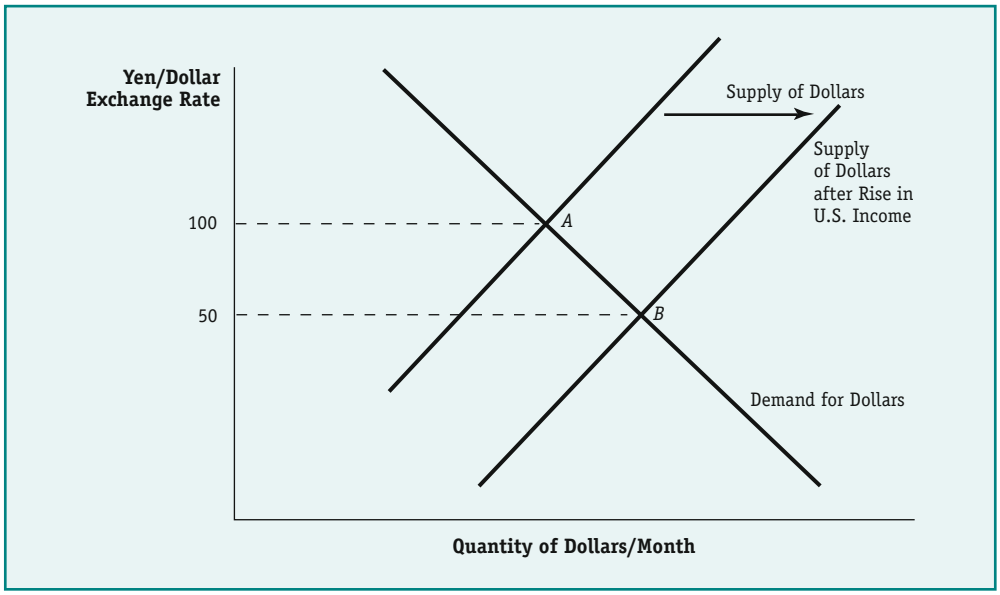
dollars in the foreign exchange market. In other words, what factors could cause the supply curve of dollars to shift? Previous research suggests that the following factors play a major role:

1. *Changes in U.S. real income.* Changes in U.S. real income and changes in the supply of dollars are positively related. The reason is that as real income grows in the United States, households and firms have more funds to spend and save. Accordingly, they will demand more U.S. goods, services, and securities and more foreign goods, services, and securities. Thus, as U.S. real income grows, ceteris paribus, the supply of dollars will increase because Americans now have more income to spend on imports. Likewise, as U.S. real income falls, ceteris paribus, the supply of dollars will decrease.
2. *Changes in the dollar price of U.S. goods relative to the dollar price of foreign goods.* Simply put, if the prices of U.S. goods rise relative to the dollar prices of foreign goods, ceteris paribus, U.S. residents will demand more foreign goods and, therefore, supply more dollars in the foreign exchange market because foreign goods are now relatively cheaper than U.S. goods. Holding the exchange rate constant, what could cause such changes in relative prices? If you said a higher inflation rate in the United States than in Japan, you are right! Likewise, using similar reasoning, if the inflation rate in the United States falls relative to that in Japan, U.S. residents will supply fewer dollars in the foreign exchange market, ceteris paribus.
3. *Changes in foreign interest rates relative to U.S. interest rates.* As foreign interest rates rise relative to U.S. rates, ceteris paribus, foreign securities become relatively more attractive. Accordingly, U.S. residents will buy more foreign securities and, thus, supply more dollars. Likewise, if foreign rates fall relative to U.S. rates, the supply of dollars decreases, ceteris paribus. To be more precise, U.S. residents will compare interest rates in the United States, i_{US}, with the expected return on foreign securities. As we shall see later in this chapter, the latter consists of the foreign interest rate, i_{FOR}, minus the expected appreciation (if any) in the value of the dollar.

For a graphical presentation of this analytical discussion of supply, see Exhibit 8-4. Study it carefully before moving on to the discussion of the demand for dollars.

Using the same logic and analytical framework we used for supply, we now ask what factors, in addition to the exchange rate, could cause foreigners to alter their demand for

8-4
Changes in the Exchange Rate: The Role of Changes in Supply

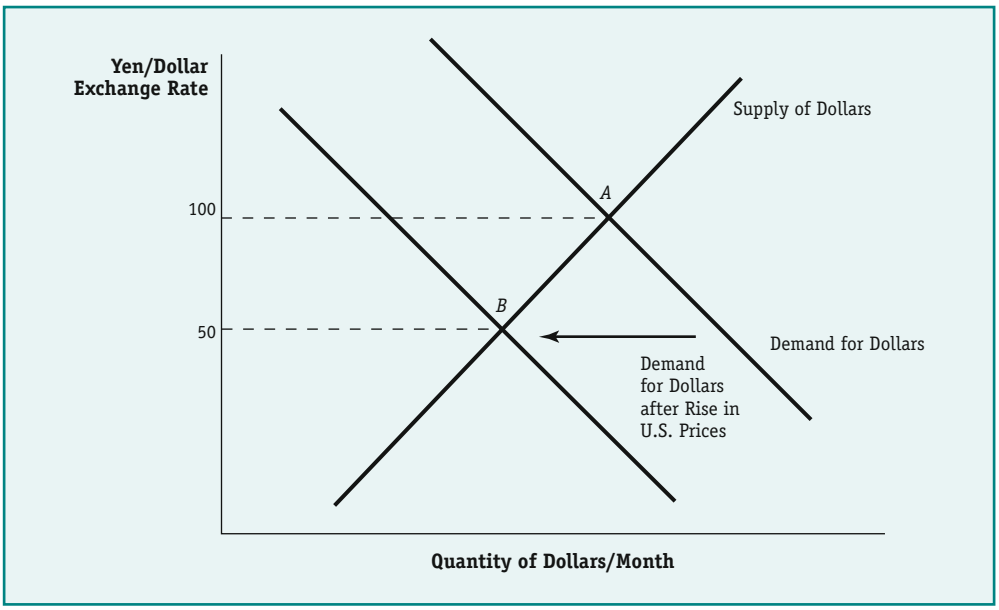


This exhibit begins with an initial equilibrium exchange rate of 100 yen. Assume that the equilibrium is now disturbed by a change in one of the factors that affect the supply of dollars, say, a rise in U.S. income, which increases the supply of dollars, as shown by the rightward shift of the supply curve. The new equilibrium at point *B* results in a depreciation of the dollar as the equilibrium exchange rate falls from 100 yen to 50 yen. Note that a rise in the prices of U.S. goods relative to the dollar prices of foreign goods, or a rise in foreign interest rates relative to U.S. interest rates, would have produced a similar increase in supply and depreciation of the exchange rate.

U.S. goods, services, and securities and thus their demand for dollars in the foreign exchange market. Remember that changes in the demand for dollars cause the demand curve for dollars to shift. We begin by identifying the major factors that can alter demand:

1. *Changes in foreign real income.* Ceteris paribus, changes in foreign real income and the demand for dollars are positively related. For example, if foreign real incomes rise, ceteris paribus, foreign firms and households will have more funds to spend and save. Accordingly, they will demand more of their own goods, services, and securities, as well as more imported goods, services, and securities. Thus, as foreign real incomes grow, ceteris paribus, the demand for dollars, reflecting the increased supply of yen to execute transactions, will grow. Following similar reasoning, if foreign incomes fall, the demand for dollars will also fall, ceteris paribus.
2. *Changes in the foreign (yen) price of foreign goods relative to the foreign price of U.S. goods.* Ceteris paribus, changes in, say, the yen price of Japanese goods relative to the yen price of U.S. goods and the demand for dollars are positively related. To see why, assume inflation accelerates in Japan, but there is no inflation in the United States. The Japanese inflation will raise the yen price of Japanese goods relative to the yen price of U.S. goods. As a result, foreigners will demand more U.S. goods and, thus, more dollars, ceteris paribus. If U.S. inflation rises relative to inflation in Japan, foreigners will demand fewer dollars, ceteris paribus.
3. *Changes in U.S. interest rates relative to foreign interest rates.* A positive relationship also exists between changes in U.S. interest rates relative to foreign rates and the demand for dollars. For example, suppose that, initially, the interest rate on both foreign

8-5
Changes in the Exchange Rate: The Role of Changes in Demand



Assume that the initial equilibrium at point *A* is disturbed by a change in one of the factors that affects the demand for dollars. In particular, suppose that the yen price of U.S. goods rises relative to the yen price of foreign goods because of inflation in the United States. As a result, foreigners' demand for U.S. goods declines, as shown by the leftward shift of the demand curve. The new equilibrium (point *B*) results in a depreciation of the dollar from 100 yen to 50 yen. Note that a fall in foreign incomes or a rise in foreign interest rates relative to U.S. rates would have produced a similar leftward shift in the demand curve and depreciation of the dollar.

government bonds and U.S. Treasury bonds is 6 percent. Portfolio managers in Japan, noticing the identical rates and recognizing the benefits of diversification, hold some of both types of bonds in their portfolios. Now, interest rates in the United States rise. As a result, the demand for U.S. securities rises, as does the demand for dollars, ceteris paribus. Likewise, if interest rates in Japan fall, the demand for dollars rises, ceteris paribus.[7] More on this later in the chapter.

These points are illustrated graphically in Exhibit 8-5. Study this exhibit carefully before moving on. Make sure that you note the similarities between the factors that cause changes in the demand for dollars and the factors that cause changes in the supply of dollars.

Recap Increases in U.S. real income, in U.S. prices relative to foreign prices, and in foreign interest rates relative to U.S. interest rates all increase the supply of dollars, and vice versa. Increases in foreign real income, in foreign prices relative to U.S. prices, and in U.S. interest rates relative to foreign interest rates all increase the demand for dollars, and vice versa.

EXCHANGE RATES IN THE LONG RUN: THE THEORY OF PURCHASING POWER PARITY

We have covered some important material. Now is a good time to stop and see how to use this analysis. Suppose that the U.S. economy is expanding at a relatively slow pace,

with real GDP growing at a 1 to 2 percent annual rate, compared to its potential growth trend of 2.5 to 3 percent. Against this background, the Federal Reserve decides that a rise in the aggregate demand for goods and services is in order. Accordingly, the Fed pursues a more stimulative monetary policy by taking action that causes interest rates to fall. The question we want to focus on in the present context is how the fall in U.S. interest rates will affect the exchange rate.

Believe it or not, the answer flows directly from the preceding discussion of changes in supply and demand. Ceteris paribus, the fall in U.S. interest rates relative to interest rates in Japan will lead to a depreciation of the dollar—that is, to a fall in the exchange rate. The reasoning is as follows: the fall in U.S. rates reduces the attractiveness of U.S. securities relative to foreign securities; as a result, foreigners will demand fewer U.S. securities and, thus, will demand fewer dollars in the foreign exchange market, while U.S. residents will demand more foreign securities and, thus, will supply more dollars in the foreign exchange market. In sum, the dollar depreciates as a result of the reduction in the demand for and rise in the supply of dollars induced by the Fed's actions. Try sketching out this scenario graphically as in Exhibits 8-4 and 8-5. If the Fed's policy works, output will expand, income will grow, and demand for imports will rise, all of which will potentially further weaken the dollar, especially if the policy fuels the expectation of inflation or actual inflation.

Taking our analysis one step further, consider the case in which the Fed policy and expanding economy causes an acceleration of the actual inflation rate in the United States. The theory of **purchasing power parity** asserts that in the long run, exchange rates adjust to different inflation rates among countries so that the *relative* purchasing power of various currencies is equalized. Thus, after full adjustment among all currencies, one currency, such as the dollar, will purchase the same market basket of goods and services in every country. In other words, an American student traveling in China can take the $1.25 they would normally spend on a can of Coke while in the United States, convert the $1.25 to the Chinese currency, and purchase an identical can of Coke in China.

Purchasing Power Parity
The theory that, in the long run, exchange rates adjust so that the relative purchasing power of various currencies is equalized.

To help clarify this theory, assume that inflation is 5 percent in the United States and 3 percent in the European Union. After the inflation and at the original exchange rate, relative prices in the United States are roughly 2 percent higher than those in the European Union.[8] As you saw earlier in the chapter, the European demand for the relatively more expensive U.S. exports will decline, and the U.S. demand for relatively cheaper U.S. imports will increase. Thus, the demand for dollars will decrease and the supply of dollars will increase. As a result, the dollar will depreciate in terms of the euro. The question is how much the dollar will depreciate. According to the purchasing power parity theory, the dollar should then depreciate by 2 percent, thus offsetting the higher U.S. inflation relative to the European Union (5 percent – 3 percent = 2 percent), leaving the relative purchasing power between the dollar and the euro unchanged.

The purchasing power parity theory is based on many, often unrealistic, assumptions. These assumptions include that all goods and services are identical and tradable, that there are no transportation costs and no barriers to trade such as tariffs, and that exchange rates are influenced only by relative inflation rates across the various countries. In reality, all goods such as Toyotas, Chevrolets, and BMWs are not identical, and therefore will not sell for the same prices. Furthermore, all goods are not tradable, and there are transportation costs and other barriers to trade. Try buying a fast-food imported hamburger or getting an imported haircut. Overall prices in one country may increase because of large price increases of nontradable goods such as housing, land, and nontradable services. In this case, a higher inflation in one country would not pass through to a depreciation of the currency.

In addition to the unrealistic assumptions, the purchasing power parity theory suffers from a lack of completeness because it neglects factors that can and do cause exchange rates to vary significantly over time. These factors include changes in productivity, economic growth, market structures, and technologies across countries, as well as shifts in factor supplies causing commodity price shocks. For example, countries with higher productivity growth or more competitive market structures, ceteris paribus, would experience relatively lower inflation and, hence, currency appreciation and vice versa. Finally, the purchasing power parity theory does not account for changes in tastes among countries. As preferences for another country's products increase, there is a tendency for that country's currency to appreciate. For example, if U.S. taste for French wine decreases (perhaps because of the development of the California wine industry), the supply of dollars would shift left (as Americans would need fewer euros to buy French wine), causing an appreciation of the dollar. Consequently, because of the unrealistic assumptions and the lack of completeness, a word of caution is needed: although there is a tendency for currencies of countries with higher relative inflation to

A Closer Look

The Big Mac Index and Purchasing Power Parity

Every year, *The Economist* newsmagazine publishes an interesting and fun Big Mac currency index based on the purchasing power parity theory. According to the theory, the dollar price of a Big Mac, the signature hamburger of the McDonald's chain, should be the same in all of the 120 countries around the world where the Big Mac is sold. The most recent table is from the July 5, 2007, issue of *The Economist.* To find the dollar price of a Big Mac, the price in the local currency is merely divided by the exchange rate. If the dollar price of a Big Mac is less than the $3.41 U.S. price, then the currency is thought to be undervalued relative to the U.S. dollar. Likewise, if the dollar price of a Big Mac is more, the currency is thought to be overvalued.

As the table shows, the dollar price of a Big Mac around the world varies from $1.45 in China to $7.61 in Iceland. Hence, according to the Big Mac index, the currency in China is thought to be undervalued by 57 percent [($1.45 – $3.41)/$3.41 = – . 5748]. While the currencies of several Asian and other emerging economies appear to be undervalued, the currency of Iceland is, according to the Big Mac index, overvalued by 123 percent [($7.61 – $3.41)/$3.41 = +1.23]. The theory of purchasing power parity does not seem to be able to explain these disparities.

The Big Mac index is flawed by the unrealistic assumptions and the lack of completeness of the purchasing power parity theory. For example, not all Big Macs taste the same in all countries. Local customs and tastes dictate each region's recipe. In some countries, Big Macs are quite spicy. (In others, mayonnaise is served with McDonald's French fries.) Likewise, there can be differences in local sales taxes, trade barriers on beef, and differences in local labor and rent costs. Thus, more factors, in addition to purchasing power parity, need to be considered in explaining exchange rate differentials and movements.

Cash and Carry
The Hamburger Standard, July 2007

	Big Mac prices				
	in local currency	in dollars	Implied ppp† of the dollar	Actual dollar exchange rate July 2nd	Under(–) / over(+) valuation against the dollar, %
United States‡	$3.41	3.41			
Argentina	Peso 8.25	2.67	2.42	3.09	–22
Australia	A$3.45	2.95	1.01	1.17	–14
Brazil	Real 6.90	3.61	2.02	1.91	+6
Britain	£1.99	4.01	1.71§	2.01§	+18
Canada	C$3.88	3.68	1.14	1.05	+8
Chile	Peso 1.565	2.97	459	527	–13
China	Yuan 11.0	1.45	3.23	7.60	–58
Czech Republic	Koruna 52.9	2.51	15.5	21.1	–27
Denmark	Dkr 27.75	5.08	8.14	5.46	+49
Egypt	Pound 9.54	1.68	2.80	5.69	–51
Euro area**	€3.06	4.17	1.12††	1.36††	+22
Hong Kong	HK$ 12.0	1.54	3.52	7.82	–55
Hungary	Forint 600	3.33	176	180	–2
Indonesia	Rupiah 15,900	1.76	4.663	9.015	–48
Japan	¥280	2.29	82.1	122	–33
Malaysia	Ringgit 5.50	1.60	1.61	3.43	–53
Mexico	Peso 29.0	2.69	8.50	10.8	–21
New Zealand	NZ$4.60	3.59	1.35	1.28	+5
Peru	New Sol 9.50	3.00	2.79	3.17	–12
Philippines	Peso 85.0	1.85	24.9	45.9	–46
Poland	Zloty 6.90	2.51	2.02	2.75	–26
Russia	Rouble 52.0	2.03	15.2	25.6	–41
Singapore	S$3.95	2.59	1.16	1.52	–24
South Africa	Rand 15.5	2.22	4.55	6.97	–35
South Korea	Won 2,900	3.14	850	9.23	–8
Sweden	SKr33.0	4.86	9.68	6.79	+42
Switzerland	SFr6.30	5.20	1.85	1.21	+53
Taiwan	NT$75.0	2.29	22.0	32.8	–33
Thailand	Baht 62.0	1.80	18.2	34.5	–47
Turkey	Lire 4.75	3.66	1.39	1.30	+7
Venezuela	Bolivar 7,400	3.45	2.170	2.147	+1
Colombia	Peso 6,900	3.53	2.023	1.956	+3
Costa Rica	Colon 1,130	2.18	331	519	–36
Estonia	Kroon 30.0	2.61	8.80	11.5	–23
Iceland	Kronur 469	7.61	138	61.7	+123
Latvia	Lats 1.39	2.72	0.41	0.51	–20
Lithuania	Litas 6.60	2.61	1.94	2.53	–24
Norway	Kroner 40.0	6.88	11.7	5.81	+102
Pakistan	Rupee 140	2.32	41.1	60.4	–32
Paraguay	Guarani 10,500	2.04	3.079	5.145	–40
Saudi Arabia	Riyal 9.00	2.40	2.64	3.75	–30
Slovakia	Koruna 61.3	2.49	18.0	24.6	–27
Sri Lanka	Rupee 210	1.89	61.6	111	–45
UAE	Dirhams 10.0	2.72	2.93	3.67	–20
Ukraine	Hryvnia 9.25	1.84	2.71	5.03	–46
Uruguay	Peso 62.0	2.59	18.2	23.9	–24

†Purchasing-power parity; local price divided by price in United States ‡Average of New York, Chicago, Atlanta and San Francisco §Dollars per pound **Weighted average of prices in euro area ††Dollars per euro

Sources: McDonald's; *The Economist*

depreciate in the long run and vice versa, the trade-off is far from perfect, as the purchasing power theory suggests.

Now would be a good time to read the accompanying "A Closer Look" on the Big Mac Index, which attempts to test the purchasing power parity theory using McDonald's famous burger.

We have examined rather carefully the variety of domestic and foreign factors that, taken together, determine the exchange rate. We would be remiss if we failed to point out that changes in the factors that affect exchange rates are ongoing and, therefore, changes in exchange rates are ongoing. In other words, in reality, demands and supplies are changing all the time, so equilibrium is a constantly moving target. For example, changes in U.S. real incomes lead to changes in other countries' real incomes, which lead to changes in U.S. incomes, which lead to changes in . . . (and so on). The interrelationships and interactions are increasingly significant as the world's economies become more intertwined. In the next section, we look at how investors choose among financial instruments denominated in various currencies.

Recap The theory of purchasing power parity asserts that exchange rates adjust to varying rates of inflation across countries so that relative purchasing power among various currencies is equalized. Although there is a tendency for countries with higher inflation to see their currencies depreciate, the correlation is far from perfect because of the limiting assumptions of the theory that do not hold in the real world.

CHOOSING AMONG DOMESTIC AND FOREIGN FINANCIAL INSTRUMENTS: THE THEORY OF INTEREST RATE PARITY

When comparing financial instruments denominated in the same currency, investors consider the return, the maturity, and the default risk. If instruments are denominated in different currencies, investors and borrowers must also consider the exchange rate risk, or the risk that the exchange rate between two currencies will change and alter the real return of the investment. For example, suppose that a U.S. investor converts dollars to Mexican pesos to make an investment denominated in pesos that earns a 10 percent nominal return. The investor expects the exchange rate to remain constant; but if the peso unexpectedly depreciates by 10 percent, the entire 10 percent return is wiped out when the pesos are converted back to dollars. Thus, exchange rate risk must be factored into any international investment.

In globalized financial markets, financial market players compare expected rates of return on instruments denominated in various currencies, including their own. To do so, they must convert all returns to an equivalent return in the domestic currency. The nominal rate of return in a domestic currency on an investment that is denominated in a foreign currency is the nominal foreign interest rate plus the expected change in the exchange rate, less an adjustment for risk that results from the uncertainty of the future exchange rate. Equation (8-7) depicts such a situation:

$$I_{US} = I_{FOR} + \mathrm{E} \tag{8-7}$$

where I_{US} is the nominal U.S. return on an investment in a foreign instrument that earns the nominal foreign interest rate, I_{FOR}, and E is the expected percentage change in the exchange rate (depreciation of the dollar) plus an exchange rate risk factor that compensates for the uncertainty of the future exchange rate. For example, if the interest is 1 percent in Japan and 6 percent in the United States, then investors must expect the dollar to depreciate, and yen to appreciate by approximately 5 percent over the next year.

Suppose the exchange rate is 100 yen/dollar now, but expected to be 95 yen/dollar in one year. The dollar would be expected to depreciate 5 percent and the yen appreciate 5 percent, so E=.05=5 percent. A Japanese investor could choose to invest 100 yen at 1 percent in Japan and have 101 yen in one year, or exchange 100 yen for $1, invest this at 6 percent, and have 1.06 dollars in one year, which could be exchanged for approximately 101 yen (95×1.06) at the year's end. Similarly, an American could invest $100 in the United States and receive $106 in one year, or change the $100 into 10,000 yen to invest this in Japan. The American investor would then receive 10,100 yen in one year, which could be exchanged for $106 (approximately 10100/.95).

Lenders compare this nominal U.S. return, I_{US}, with the U.S. interest rate and choose the instrument that offers the highest return, while borrowers choose to borrow in the market that offers the lowest rate as expressed in their domestic currencies. Because of market adjustments, if the nominal U.S. return is greater than the nominal foreign return plus the exchange rate adjustment, lenders will supply more funds in the U.S. market, and borrowers will borrow more funds in foreign markets. The theory of **interest rate parity** asserts that the adjustments will continue until the U.S. and foreign nominal interest rates are equal, except for the expected exchange rate adjustment and an exchange rate risk factor. When interest rates have adjusted so that rates between countries differ only by the expected appreciation or depreciation of the currency, then interest rate parity has been reached and international financial markets are in equilibrium.

Interest Rate Parity
The theory that in equilibrium, interest rates adjust so that after adjustments have been made for expected inflation and exchange rate risk, returns are equalized across countries.

In reality, borrowers and lenders are making decisions based on the expected real return rather than nominal returns. The real interest rate (return) is the nominal return less expected inflation. At times, we may wish to express returns between nations in terms of real interest rates as opposed to nominal rates. To do so for the United States, we must subtract expected U.S. inflation from each nominal rate in Equation (8-7), as in Equation (8-8). In equilibrium, the real U.S. interest rate, R_{US}, will be:

$$R_{US} = I_{US} - P_{US} = I_{FOR} + E - P_{US} \tag{8-8}$$

where P_{US} is the expected U.S. inflation rate. Likewise, we can express the nominal foreign rate, I_{FOR}, in terms of the real foreign rate, R_{FOR}, plus the expected foreign inflation, P_{FOR}, to arrive at the equilibrium real U.S. interest rate in terms of the foreign real rate and domestic and foreign expected inflation. The results are summarized in Equation (8-9):

$$R_{US} = R_{FOR} + P_{FOR} + E - P_{US} \tag{8-9}$$

The degree of capital mobility is the ease with which funds can flow in and out of financial instruments denominated in different currencies. We can conclude that with greater capital mobility, the real U.S. and foreign interest rates will tend to be equalized after differences in expected inflation and expected changes in exchange rates, along with the uncertainty of these changes, have been taken into account. As you shall see in Chapter 23, foreign exchange futures, forward, and swap agreements can be used to hedge or reduce interest rate risk. In the next section of this chapter, we look at the often mysterious concept of the balance of payments that keeps track of the financial flows among nations.

Recap

Financial market participants compare expected rates of return on instruments denominated in different currencies. The expected nominal rate of return on a foreign investment is the foreign interest rate plus the change in the exchange rate less an adjustment for risk from the uncertainty of the future exchange rate. The expected real return includes an adjustment factor for expected inflation in both countries. In equilibrium, interest rates adjust so that after adjustments have been made for expected inflation and exchange rate risk, returns are equalized across countries.

Looking Back

The Causes and Consequences of Dollar Exchange Rate Movements Since 1980

The internationalization or globalization of the U.S. economy became apparent to all during the first half of the 1980s. During 1979 and 1980, the international value of the dollar reached a record low. As can be seen in Exhibit 8-1, by early 1985, the dollar had appreciated by more than 60 percent from its low.

What caused this appreciation? Most experts agree that it was a combination of several factors. First, in late 1979 and early 1980, the Fed embarked on a program of monetary restraint to lower the high inflation rate in the United States. This had the effect of raising interest rates in the United States—in particular, real interest rates—relative to real interest rates in the rest of the world. Second, in 1981, Congress enacted a large tax cut. The tax cut, along with the failure to cut spending, led to a larger government deficit, which also tended to raise real interest rates in the United States.

The rise in real U.S. interest rates induced by the monetary and fiscal policy actions, in turn, increased foreign demand for U.S. securities and, thus, the demand for dollars, while reducing U.S. demand for foreign securities and, thus, the supply of dollars in the foreign exchange market. As a result, the rise in U.S. real interest rates relative to real rates in the rest of the world helped produce a substantial appreciation of the dollar.

What were the consequences of the dollar's appreciation? Simply put, the rise in the international value of the dollar had a dramatic effect on the U.S. economy. As one would predict, based on the discussion in this chapter, the appreciation tended to raise the prices of U.S. goods in foreign markets, discouraging exports, and tended to lower the prices of foreign goods in the United States, encouraging imports. The result was a substantial increase in the current account deficit. By 1985, the United States was buying $150 billion more goods and services from abroad than it was selling abroad. Naturally, this deterioration in U.S. international competitiveness reduced employment and output in the United States relative to what they would have been. (Actually, employment and output initially decreased, but by 1985, both were on the rise. In 1985, the current account deficit was rising, the budget deficit was rising, GDP was rising, and employment was rising!) The lower import prices encouraged by the appreciation also tended to dampen the inflation rate in the United States.

Beginning in early 1985, U.S. policy makers in coordination with major U.S. trading partners agreed to a concerted effort to lower the value of the dollar. Central banks would supply dollars and demand their own currencies. The pressure to intervene came from the realization that the U.S. economy was severely uncompetitive. The "overvalued" dollar was causing a record trade deficit, and U.S. jobs were being lost in domestic exporting industries and industries that suffered from competition from imports. The value of the dollar did fall consistently in the late 1980s due both to central bank intervention and to falling U.S. interest rates that reduced the demand for U.S. securities. The trade deficit also fell, but not as fast or as far as economists had expected, given the depreciation of the dollar. By the early 1990s, the dollar was about 50 percent lower than in 1985, but the trade deficit, although reduced, still

persisted. In the short run, the percentage decrease in the demand for foreign products was less than the percentage decrease in the exchange rate, although this condition was not expected to persist in the long run.

In the early 1990s, the desire to reduce the government budget deficit led to contractionary fiscal policy. At the same time, the Fed pursued a relatively easy monetary policy due to the weak economy and reduced fears of inflation. These policies produced lower interest rates and depreciation of the dollar. In mid-1993, despite these circumstances, the trade deficit began to widen. No doubt this was due to the mild recovery of the U.S. economy and the faltering of many foreign economies.

The demand for imports increased in the recovering domestic economy, while the demand for exports decreased in the stumbling foreign economies. With U.S. interest rates at low levels relative to those of the rest of the world, particularly a united Germany, some economists wondered how far and for how long the dollar would fall.

By mid-1995, the dollar was again on the rise. U.S. interest rates had risen above foreign rates due to the strength of the U.S. economy and tightening actions taken by the Fed. The relatively higher U.S. interest rates led to increasing capital inflows. Continued strengthening of the U.S. economy raised expectations that the Fed would continue taking actions that would lead to increases in interest rates. Uncertainty abroad and the exceptionally strong performance of the U.S. economy led to further strengthening of the dollar.

During late 1997 and early 1998, the financial crisis in Asian economies caused the ongoing appreciation to escalate. A "flight to quality" in international financial markets triggered by the crisis in Asia often meant a flight into dollars and dollar-denominated financial instruments. Finally, in late fall 1998, the overvalued dollar did plummet as the Fed on two occasions took action that lowered interest rates.

By mid-1999, the dollar was again on the rise as an overheating U.S. economy continued to demonstrate incredible resilience. By late 2000, the dollar was stronger than it had been since 1986. The trade deficit was also very high, buoyed by a booming U.S. economy. As the economy fell into recession in 2001, the Fed orchestrated numerous cuts in the interest rate, and the Bush administration had a significant tax cut passed by Congress. Ceteris paribus, the hope was that falling interest rates and a tax decrease would work together to offset the strong recessionary tendencies the economy was experiencing. The U.S. economy was experiencing expansionary monetary policy, which led to falling interest rates. The tax cut combined with increased government spending to fight a war in Iraq caused the budget surplus to reach a record deficit. Although these actions would normally cause a fall in the value of the dollar, it was not until 2002 when this began to occur.

The dollar fell against most major currencies from 2002 until the end of 2004, but in late 2004 and early 2005, it began to rise again. This may have been due to the apparent strength of the U.S. economy and the belief that this strength, at least in comparison to Europe, would continue. From 2005 to 2008, the dollar began to decline versus other currencies such as the euro. This seems related to the developing weakness of the U.S. economy related to declining real estate prices and the connected financial problems. Federal Reserve interest rate cuts, at a time when interest rates in other countries were either stable or increasing, put further downward pressure on the dollar into 2008. Where the dollar will end up, given the severity of the global financial crisis that is manifesting itself in late 2008, remains to be seen.

DEFINING THE BALANCE OF PAYMENTS AND ITS INFLUENCE ON THE EXCHANGE RATE, THE FINANCIAL SYSTEM, AND THE U.S. ECONOMY

Balance of Payments
The record of transactions between the United States and its trading partners in the rest of the world over a particular period of time.

Credit
In the balance of payments, any item that results in a payment by foreigners to Americans.

Merchandise Exports
Foreign purchases of U.S. goods.

Debit
In the balance of payments, any transaction that results in a payment to foreigners by Americans.

Merchandise Imports
U.S. purchases of foreign goods.

Current Account
Transactions that involve currently produced goods and services, including the balance of goods and services.

Net Transfer Payments
In the current account, the difference between transfer payments received from and transfer payments made to foreigners.

Trade Balance
The difference between merchandise exports and imports.

Trade Deficit
Status when merchandise imports are greater than exports.

Trade Surplus
Status when merchandise exports are greater than imports.

Balance of Goods and Services
Net exports of services plus the trade balance.

The supply and demand forces that determine the exchange rate are reflected in the **balance of payments.** Simply put, the balance of payments for the United States is the record of transactions between the United States and its trading partners in the rest of the world over a particular period of time, such as a year. It is a record of the international flow of funds for purchases and sales of goods, services, and securities.

The accounting procedure underlying the balance of payments is based on a standard double-entry bookkeeping scheme, such as that used by business firms or households to record receipts and payments. This means that receipts (sources of funds such as income or borrowing) will, by definition, equal payments (uses of funds). In the balance of payments, all transactions that result in payments by foreigners to Americans are recorded as receipts; they are **credit** or plus items. Examples of such transactions include foreign purchases of U.S. goods (called **merchandise exports**), foreign purchases of U.S. securities (in effect, exports of securities), and expenditures by foreign tourists in the United States (in effect, exports of services). All transactions resulting in payments by Americans to foreigners are recorded as payments; they are negative or **debit** items. Examples of such payments include U.S. purchases of foreign goods (called **merchandise imports**), U.S. purchases of foreign securities (in effect, imports of securities), and expenditures by U.S. residents traveling abroad.

Over the years, government statisticians and analysts have found it useful to divide the balance of payments into several parts by grouping various types of receipts and payments into particular accounts. These accounts are discussed below and shown in Exhibit 8-6, which provides a simplified and hypothetical balance of payments for the United States. Note that for now, we will ignore government transactions in foreign currencies—the so-called Official Reserve Account of the balance of payments. This complication will be taken up when we discuss international policy in Chapters 25 and 26. The balance of payments may seem imposing at first, but as we take a closer look at the various accounts, you will find that it is not so formidable.

The Current Account

The **current account** brings together transactions that involve currently produced goods and services. It is composed of exports and imports of goods and services and **net transfer payments** (also called *net unilateral transfers*). The difference between merchandise exports and imports, often referred to in news reports as the **trade balance,** is taken by many observers to be an important indicator of a country's ability to compete internationally in the production and sale of goods. When merchandise imports are greater than exports, as they have been in the United States for some years, a country has a **trade deficit,** suggesting some deterioration in international competitiveness. It could just as well suggest an improvement in the country's ability to attract foreign investment. The hypothetical figure in Exhibit 8-6 shows a U.S. trade deficit—indicated by (4) in the exhibit—of $200 billion. In contrast, if exports are greater than imports, as has been the case in Japan for some time, a country has a **trade surplus,** suggesting that it is competing successfully in the world economy or that its citizens are investing heavily abroad.

When net exports of services (5) involving tourism, transportation, insurance, and financial services are added to the trade balance (4), we get the **balance of goods and services** (6), which is often referred to as *net exports.* If net exports are negative, as they have been in the United States throughout the 1980s, 1990s, and 2000s, then we are buying more goods and services from foreigners than they are buying from the United

8-6

A Hypothetical and Simplified Balance of Payments for the U.S. Economy in the Year 2009 (in Billions of Dollars)

Account	Component	Receipts from Foreigners: Use of $ by foreigners	Payments to Foreigners: Source of $ by foreigners	Balance
Current	(2) Merchandise exports	+$400		(4) Balance of trade:
	(3) Merchandise imports		−600	(2) + (3) = −$200
	(5) Net exports of services	+$50		(6) Balance of goods and services:
				(4) + (5) = −$150 = net exports
	(7) Net unilateral transfers		−$30	(1) Balance on current account:
				(6) + (7) = −$180
Capital	(9) Capital inflows	+$280		(8) Balance on capital account:
	(10) Capital outflows		−$100	(9) + (10) = $180
		Total uses	**Total sources**	
Balance of Payments		+$730	−$730	(1) + (8) = 0

States. Relatively speaking, the result is that GDP and, thus, production and employment in the United States are lower than they would have been if net exports had been less negative, ceteris paribus.[9]

Net transfer payments are the difference between transfers received from foreigners and transfers made to foreigners, including payments such as U.S. government aid to foreigners, aid from foreign governments to the United States, and private charitable relief. Adding net unilateral transfers (7) to the balance of goods and services, or net exports (6), yields the **balance on current account** (1), which in our example is in deficit by $180 billion.

Balance on Current Account
The balance of goods and services plus net unilateral transfers.

The Capital Account

The **capital account** summarizes the financial flow of funds and securities between the United States and the rest of the world. The globalization of the U.S. financial system—a fancy term to describe the tremendous growth of international lending and borrowing—is reflected in a surge of U.S. investment in international stocks, bonds, and mutual funds in the recent decades, as well as the increased borrowing abroad by U.S. entities to fund the U.S. current account deficit.

Capital Account
The financial flow of funds and securities between the United States and the world.

Purchases of U.S. financial securities by foreigners and, more generally, borrowing from foreign sources by U.S. firms and residents, result in **capital inflows** into the United States; these are receipt (credit or plus) items in the capital account, as shown in Exhibit 8-6. Purchases of foreign financial securities by U.S. residents and borrowing by foreigners from U.S. banks and other sources result in **capital outflows** from the United States; these are payment (debit or negative) items in the capital account. In our

Capital Inflows
Purchases of U.S. financial securities by foreigners and borrowing from foreign sources by U.S. firms and residents.

Capital Outflows
Purchases of foreign financial securities by U.S. residents and borrowing by foreigners from U.S. banks and other domestic sources.

Net Capital Inflow
Status when there is a surplus in the capital account and capital inflows exceed capital outflows.

hypothetical example in Exhibit 8-6, the balance on capital account (8), which is equal to the difference between capital inflows and capital outflows, is in surplus by $180 billion—and the United States is experiencing a **net capital inflow.**

Recap

The balance of payments for the United States is the record of transactions between the United States and its trading partners in the rest of the world over a particular time period. The balance of payments consists of the current account and the capital account. The current account brings together transactions involving currently produced goods and services. It includes the balance of goods and services and unilateral transfers. The capital account measures the flow of funds and securities between the United States and the rest of the world.

So much for the components of the balance of payments. What do they have to do with the exchange rate and U.S. markets? Believe it or not, the various tools of analysis necessary to answer this question have already been developed. All we need to do is to bring them together.

THE BALANCE OF PAYMENTS AND THE EXCHANGE RATE

Take a careful look at the bottom line in Exhibit 8-6. Not surprisingly, it says that the balance of payments balances; the hypothetical $180 billion deficit in the current account (1) is exactly offset by a $180 billion surplus in the capital account (8).[10] Another way of saying the same thing is that the sum of all the items in the Payments to Foreigners column is exactly equal to the sum of all items in the Receipts from Foreigners column.

To see why this equality is not just the result of bookkeeping gimmickry and why it relates directly to the determination of the exchange rate and the role it plays in our economy, note that all items in the Receipts column represent foreign demands for U.S. goods, services, and securities—the very items that determine the demand for dollars in the foreign exchange market. Similarly, all items in the Payments column represent U.S. demands for foreign goods, services, and securities—the very items that determine the supply of dollars in the foreign exchange market. Assuming that the exchange rate is flexible and free to move in response to any change in demand or supply, the exchange rate will move to that rate where the quantity of dollars demanded/month is equal to the quantity of dollars supplied/month. Put in terms of Exhibit 8-6, the equilibrium exchange rate will change until the sum of all items in the Receipts column, which reflects the quantity of dollars demanded/month, is equal to the sum of all items in the Payments column, which reflects the quantity of dollars supplied/month. While the uses of funds are always equal to the sources (for every source, there is a use), the intended uses and sources may differ significantly, and these differences in plans and intentions move the exchange rate.

While examining the factors determining exchange rates, you learned that a fall in U.S. interest rates relative to foreign rates would tend to decrease the foreign demand for U.S. securities and, thus, the demand for dollars. You also learned that a fall in U.S. rates relative to foreign rates would tend to increase the U.S. demand for foreign securities and, thus, the supply of dollars. In balance of payments terminology, the relatively lower U.S. interest rates would cause increased capital outflows and decreased capital inflows. The fall in the demand for dollars and the increase in the supply of dollars, in turn, would lead to a depreciation of the dollar.

If capital outflows rise and capital inflows fall, the capital account surplus in Exhibit 8-6 will fall. If nothing happens to the current account, the balance of payments

will no longer balance. Obviously, something else must change. What happens is this: As the exchange rate depreciates, a number of adjustments in foreign demands and U.S. demands ensue. Among the most important is a decrease in the current account deficit, reflecting, in large part, a decrease in the trade deficit. To be more specific, the depreciation of the dollar will tend to decrease the yen (foreign) price of U.S. goods abroad, thus increasing U.S. exports. The depreciation will also tend to raise the dollar price of foreign goods in the United States, thus decreasing U.S. imports and the trade deficit. From a purely domestic perspective, the fall in U.S. interest rates pulls foreign funds from the U.S. financial system, leads to a depreciation of the dollar, and tends to increase foreign demand for U.S. output and, thus, increase U.S. employment relative to what it otherwise would have been.

So why shouldn't a country cut its interest rates relative to its trading partners, reduce the value of its currency, and stimulate exports in order to increase its rate of growth? Note, this process depends on reducing imports and increasing exports, i.e., the country producing more and consuming less. Another problem, especially important for small countries, is that the increased price of imports in domestic currency terms can fuel inflation. We will explore such issues in Chapter 26.

This chapter has focused on the theory of exchange rate determination, and the following one will examine the relevant international institutions and their development. Although increased globalization has blurred the distinction between international and national goods and financial markets, these two chapters give us an opportunity to focus directly on international aspects and clarify international issues.

Recap The exchange rate adjusts until the quantity demanded of dollars/month is just equal to the quantity supplied/month in international financial markets. If the intended sources and uses of dollars differ, changes in the exchange rate will bring them into equality. In the following chapter, we will consider the international financial system and recent changes in it.

Summary of Major Points

1. The exchange rate is the number of units of foreign money (currency) that can be acquired with one unit of domestic money. If the exchange rate rises, the dollar is said to have appreciated relative to other currencies. If the exchange rate falls, the dollar has depreciated.
2. The dollar price of foreign goods is equal to the foreign price of foreign goods divided by the exchange rate. The foreign price of U.S. goods is equal to the dollar price of U.S. goods multiplied by the exchange rate. Accordingly, depreciation of the dollar will lower the price of U.S. goods in foreign markets and raise the price of foreign goods in the United States. An appreciation will raise the price of U.S. goods in foreign markets and lower the price of foreign goods in the United States.
3. The exchange rate is a price—the price of one national currency in terms of another—and is determined by supply and demand. The demand for dollars in the foreign exchange market reflects the demand by foreign residents for U.S. goods, services, and financial claims. The supply of dollars comes from the demand by U.S. residents for foreign goods, services, and financial claims.
4. The demand for dollars in the foreign exchange market shows an inverse relationship between exchange rate and the quantity demanded of dollars/month. This demand curve shifts rightward if foreign income increases, if the foreign inflation rate is higher than the U.S. rate, or if the foreign interest rate falls relative to the U.S. interest rate. The supply of dollars in the foreign exchange market

shows a positive relation between the exchange rate and the quantity supplied of dollars/month. This supply curve shifts rightward if U.S. income increases, if the U.S. inflation rate is higher than the foreign rate, or if the U.S. interest rate falls relative to the foreign interest rate.

5. A depreciation of the dollar can result from one or more of the following: a fall in U.S. interest rates relative to foreign interest rates, a rise in U.S. income, a fall in foreign income, and/or more inflation in the United States than abroad. An appreciation of the dollar can result from one or more of the following: a rise in U.S. interest rates relative to foreign interest rates, a fall in U.S. income, a rise in foreign income, and/or less inflation in the United States than abroad.
6. If the exchange rate is flexible and thus free to move in response to any change in the demand for or supply of dollars, the exchange rate will move to that rate where the quantity of dollars demanded/month is equal to the quantity of dollars supplied/month. According to the purchasing power parity theory, exchange rates adjust in the long run so that the relative purchasing power of various currencies is equalized. The purchasing power parity theory is based on the assumption that goods are identical and tradable, and that there are no transportation costs or barriers to trade. Also, the theory ignores changes in tastes, productivity, economic growth, market structures, and technologies across countries. Thus, there are many other factors that affect exchange rates. Although there is a tendency for countries with relatively high inflation rates to experience currency depreciation, the correlation is not nearly as perfect as the purchasing power parity theory implies.
7. The nominal rate of return on a foreign investment is the foreign interest rate plus the expected change in the exchange rate less an adjustment for risk from the uncertainty of the future exchange rate. The expected real return includes an adjustment factor for expected inflation in both countries. In equilibrium, when interest rate parity is achieved, interest rates adjust so that after adjustments have been made for expected inflation and exchange rate risk, returns are equalized across countries.
8. The balance of payments is the record of transactions between the United States and its trading partners in the rest of the world over a particular period of time. It keeps track of the flow of funds for the purchases of goods, services, and securities. Ignoring official government transactions, it is composed of the current account and the capital account. If a change, such as a policy-induced rise in U.S. interest rates relative to foreign interest rates, results in capital inflows and a larger capital account surplus, it will also result in an appreciation of the dollar. In turn, the appreciation of the dollar will tend, among other adjustments, to reduce U.S. exports and to increase U.S. imports. These adjustments will tend to produce a larger current account deficit, which will rebalance the balance of payments.

Key Terms

Appreciated, p. **158**
Balance of Goods and Services, p. **176**
Balance of Payments, p. **176**
Balance on Current Account, p. **177**
Capital Account, p. **177**
Capital Inflows, p. **177**
Capital Outflows, p. **177**
Credit, p. **176**
Current Account, p. **176**
Debit, p. **176**
Depreciated, p. **159**
Exchange Rate, p. **158**
Foreign Currency (Money), p. **158**
Foreign Exchange, p. **159**
Foreign Exchange Market, p. **160**
Interest Rate Parity, p. **173**
Merchandise Exports, p. **176**
Merchandise Imports, p. **176**
Net Capital Inflow, p. **178**
Net Transfer Payments, p. **176**
Purchasing Power Parity, p. **169**
Trade Balance, p. **176**
Trade Deficit, p. **176**
Trade Surplus, p. **176**

Review Questions

1. Define *exchange rate*, *foreign currency*, and *foreign exchange market*.
2. Distinguish between a change in the quantity demanded of foreign exchange and a change in demand for foreign exchange. Do the same for the quantity supplied and the supply of foreign exchange.
3. Explain the relationship between the supply of dollars in the foreign exchange market and debit items in the balance of payments. Do the same for the demand for dollars in the foreign exchange market and credit items in the balance of payments.
4. Defend the following statement: The balance of payments always balances.
5. Explain how the trade balance, the balance of goods and services, and the balance of payments differ.
6. How is a surplus in the current account related to a deficit in the capital account? How is a deficit in the current account related to a surplus in the capital account?
7. If interest rates in the United States were lower than rates in the rest of the world, would the United States be more likely to be experiencing a net capital inflow or a net capital outflow? Ceteris paribus, would the current account be in surplus or deficit?
8. If the demand for U.S. exports falls because of a change in foreign tastes, what will happen to the exchange rate? What will happen to the trade balance and the balance of goods and services?
9. What would happen to the exchange rate if foreigners decided to sell U.S. securities, perhaps because of an increase in the perceived risk of investing in the United States?
10. What is the difference between the trade balance and the current account balance?
11. What are the assumptions of the purchasing power parity theory? What are the reasons that the theory may not offer a complete explanation of exchange rate differentials?
12. What is interest rate parity?

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

✓13. If a hotel room in downtown Tokyo costs 20,000 yen per night and the yen/dollar exchange rate is 100, what is the dollar price of the hotel room? If the yen/dollar exchange rate increases to 150, what happens to the dollar price of the hotel room?

✓14. If a hotel room in downtown Los Angeles costs $100 per night and the yen/dollar exchange rate is 100, what is the yen price of the hotel room? If the yen/dollar exchange rate increases to 150, what happens to the yen price of the hotel room?

✓15. Assume that the dollar appreciates by 10 percent in terms of the Mexican peso. Explain what happens to the dollar price of tequila from Mexico after the appreciation. What happens if the dollar depreciates by 10 percent? Assume the peso price of tequila in Mexico is unchanged.

✓16. If a bottle of rare French wine sells for 40 euros in Paris and the exchange rate is 0.9 euros/dollar, how much will the bottle of wine sell for in New York City? Assume purchasing power parity holds.

✓17. Use graphs to show what happens to the demand for and supply of dollars in the foreign exchange market in the event of each of the following:
   a. Domestic income rises.
   b. Foreign income rises.
   c. Domestic inflation rises relative to foreign inflation.
   d. Domestic interest rates rise relative to foreign interest rates.

✓18. Use graphs to demonstrate that when both domestic and foreign incomes are rising, we cannot be sure of the direction of exchange rates.

✓19. If merchandise exports are $600 and merchandise imports are $500, what is the trade balance?

✓20. If there is a surplus of $100 in the capital account, no unilateral transfers, and a $50 deficit in the net exports of services, what is the trade balance?

✓21. If $1 = 150 yen and 1 yen = 75 British pounds, what is the pound/dollar exchange rate? What is the dollar/pound exchange rate?

✓22. If the yen/dollar exchange rate is 125, how much will 25,000 yen cost in dollars? If the dollar appreciates to 150 yen/dollar, how much will the 25,000 yen cost in dollars?

✓23. If the yen/dollar exchange rate is 125, how many yen will $15,000 be worth? If the dollar depreciates to 100 yen/dollar, how many yen will $15,000 be worth?

✓24. Explain how, according to the purchasing power parity theory, exchange rates will adjust if inflation in the United States is 3 percent and inflation in Japan is 1 percent.

✓25. If nominal interest rates fall by 2 percent in the United States, ceteris paribus, explain what will happen to exchange rates to achieve interest rate parity

Suggested Readings

For detailed information on the balance of payments, go to **http://www.newyorkfed.org/aboutthefed/fedpoint/fed40.html.**

Although we ignored (for the time being) government transactions in foreign currencies, the *Federal Reserve Bulletin Statistical Supplement* includes data on international transactions on a quarterly basis. The January 2008 supplement is available online at **http://www.federalreserve.gov/pubs/supplement/2008/01/default.htm.**

Before he became the Federal Reserve Chairman, Ben Bernanke gave an interesting and relevant speech: "The Global Saving Glut and the U.S. Current Account Deficit," March 10, 2005. It is available online at **http://www.federalreserve.gov/boarddocs/speeches/2005/200503102.**

To understand the importance of the U.S. current account deficit, see "Financial Globalization and the U.S. Current Account Deficit" by Matthew Higgins and Thomas Klitgaard, in the Federal Reserve Bank of New York publication *Current Issues in Economics and Finance*, December 2007, available online at **http://www.newyorkfed.org/research/current_issues/ci13–11.html.**

For an interesting discussion about the relationship between the government and trade deficits, see the remarks by Governor Edward M. Gramlich, "Budget and Trade Deficits: Linked, Both Worrisome in the Long Run, but Not Twins" at the Los Angeles Chapter of the National Association for Business Economics Luncheon, Los Angeles, California, March 31, 2004. The remarks are available online at **http://www.federalreserve.gov/boarddocs/speeches/2004/20040225/default.htm.**

Beth J. Harpaz wrote an article about the effects of a weak dollar on a college student traveling in Italy in 2004. Titled "Strategies for Coping with the Weak Dollar," this Associated Press article, dated March 25, 2004, is available online at **http://www.euroquest.com/PressReleases/MuseumPass/MuseumPass%200n%20MSNBC.pdf.**

Since 1986, *The Economist* has been making the study of real exchange rates a bit more spicy by tracing the dollar price of Big Macs around the world, as discussed in the body of the chapter. See the full text of the 2007 Big Mac Index article, "Sizzling—Food for Thought About Exchange Rate Controversies," *The Economist* (July 5, 2007).

An interesting variation of the Big Mac Index is the Starbucks Index: "Burgers or Beans—A New Theory Is Percolating Through the Foreign-Exchange Markets" can be found in the July 15, 2004 edition of *The Economist*. The article examines real exchange rates by considering the dollar price of a Starbucks tall latte in some of the 32 countries in which it is now sold. Information about *The Economist* can be found online by accessing **http://www.economist.com.**

We suggest the following free publications from the New York Fed: *Basics of Foreign Trade and Exchange and Balance of Payments* (Fedpoints 40), and *All About the Foreign Exchange Market in the United States*. For those of you who prefer comic books, request *The Story of Foreign Trade and Exchange*. All three are available by writing to the Federal Reserve Bank of New York, Public Information Department, 33 Liberty Street, New York, NY 10045. You can view the Fedpoints and other New York Fed publications online at **http://www.newyorkfed.org.**

Another Fed publication available online is *Strong Dollar Weak Dollar, Foreign Exchange Rates and the U.S. Economy*, Federal Reserve Bank of Chicago. It is available at **http://www.chicagofed.org/publications/strongdollar/strongdollar.pdf.**

For a look at the implications of the euro, see Robert A. Mundell, *The Euro as a Stabilizer in the International Economic System* (Norwell, MA: Kluwer Academic Press, 2000).

Endnotes

1. Remember our earlier warnings about market jargon? Well, the problem is acute in the international sphere. For example, note that the definition of foreign currency includes foreign coin, paper currency, and checkable deposits; in contrast, our definition of currency in the United States includes paper currency and coin only (Chapter 2).
2. Exchange rates can also be expressed from the other direction. For example, if $1 will buy 100 yen, then 100 yen will buy $1 and 1 yen will buy $.01 [1/(100 yen)=$.01].
3. In Chapter 2, we defined the dollar as a unit of account by which exchange values of goods and services could be measured. In this chapter, we are talking about the flow of funds—that is, the supply and demand of dollar-denominated funds—not dollars. So, when we use the term *dollars*, we really mean *dollar-denominated funds.*
4. In Chapters 2 and 5, we saw that the interest rate can be determined by either a stock model (the supply of and demand for money) or a flow model (the supply of and demand for loanable funds/month). Exchange rate determination is an analogous situation in that the exchange rate can be explained using a stock model (dealing with the supply of and demand for foreign exchange at a particular moment), or a flow model (dealing with flows of foreign exchange over a particular time period). In this chapter, we have opted for the flow model, noting that just as with all stock and flow models, each can generally be converted into the other without loss of substance. We hope you recall that over time, flows generate changes in stocks and that by measuring stocks at two points in time, a flow over time can be determined. For simplicity, we arbitrarily picked one month as our time period. The quantity demanded of dollars/month is the amount of dollars that will be demanded at a specific exchange rate.
5. Actually, we are also assuming that the demand for wheat, and U.S. products in general, is relatively elastic with regard to the exchange rate—that is, as the exchange rate changes, ceteris paribus, quantity demanded/month changes by a larger percentage than the exchange rate, causing total dollar expenditures to fall when the exchange rate increases and to rise when the exchange rate decreases. This is a reasonable assumption in the long run, although demand for U.S. products may be relatively inelastic in the short run.
6. We are also making the reasonable assumption that, ceteris paribus, the quantity demanded of foreign goods/month by U.S. residents changes by a larger percentage than the percentage change in the exchange rate. Thus, as the exchange rate appreciates, the quantity supplied of dollars/month also increases. And as the exchange rate depreciates, the quantity supplied of dollars/month also decreases. This assumption, which is reasonable in the long run, may not hold in the short run.
7. These examples of supply and demand shifters generally assume constant future expected exchange rates and future expected inflation. Without this simplification, results become more complicated. For example, an increase in the nominal U.S. interest rate could correspond with a decreased demand for U.S. dollars by foreigners if they expect higher U.S. inflation in the future and a depreciating U.S. dollar. This would be the opposite of what we would expect with future expected inflation and exchange rate constant.
8. To be more precise, the U.S. relative prices would increase by 1.05/1.03 – 1 = .01942, or 1.942 percent over European prices. We follow standard convention in rounding this to 2 percent.
9. Don't let the terminology confuse you: *Less negative* refers to a smaller trade deficit of goods and services, meaning either more exports or fewer imports and, hence, ceteris paribus, more U.S. jobs and production in either the domestic exporting industries or those industries competing with imports. If the United States were running a trade surplus of goods and services, the greater the surplus, the greater would be the stimulus to U.S. GDP.
10. We are ignoring any official government transactions in foreign exchange markets until Chapter 25.

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PART 3

Central Banking and Monetary Policy

9 The Overseer: The Federal Reserve System

10 Monetary Policy

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CHAPTER NINE

9

Speak softly and carry a big stick.

—Theodore Roosevelt

The Overseer: The Federal Reserve System

Learning Objectives

After reading this chapter, you should know:

How the Fed is organized

What the Federal Open Market Committee (FOMC) is

The most important functions of the Fed

The Fed's major policy tools

The controversy regarding Fed independence

UNRAVELING THE FED'S MYSTIQUE

"Stock Market Surges Following Fed Testimony," "Interest Rates Rise in Anticipation of Tighter Fed Policy," "Fed Approves Mega Bank Merger," "Fed Actions Prevent Crisis After Bank Failure": such headlines appear nearly every day in the nation's business and financial press. To help understand the prominent role of the Fed and its operations, we will examine its origin, role, organization, and policy tools. Many of the details regarding the formulation of policy and the precise linkages between policy actions and the economy will be examined in later chapters. For now, we want to focus on these questions: What is the Fed? Why does the Fed appear to have such great power and influence over the economy? Who does what within the Fed? Why do they do it?

ORGANIZATIONAL STRUCTURE OF THE SYSTEM

Federal Reserve System
The central bank of the United States that regulates the banking system and determines monetary policy.

Federal Reserve Act
The 1913 congressional statute that created the Federal Reserve System.

Lender of Last Resort
The responsibility of the Fed to provide an elastic currency by lending to commercial banks during emergencies.

Banking Reform Acts of 1933 and 1935
Statutes passed by Congress in response to the collapse of the banking system between 1930 and 1933.

The **Federal Reserve System** was created by Congress in 1913. Experience in the United States and abroad had finally convinced lawmakers that such an institution was needed to avoid the banking crises that had periodically plagued the economy. The main purpose of the **Federal Reserve Act** was simple. It created a central bank—a kind of bank for banks—that could lend funds to commercial banks during emergencies and thus provide these banks with the funds necessary to avoid insolvency and bankruptcy. An example of such an emergency is a major crop failure that makes it impossible for farmers to pay off their bank loans. The 1913 legislation referred to this role of the Fed as providing an "elastic currency"; today, it is often referred to as **"the lender of last resort"** function.

Over time, the responsibilities of the Federal Reserve have been expanded. In the midst of the Great Depression, it was clear that the limited scope and powers of the Federal Reserve System were not up to handling the nearly 8,000 bank failures that occurred during the 1930–1933 period. In the **Banking Reform Acts of 1933 and 1935,** Congress provided many of the additional policy tools and regulations that the Fed needed.

The most significant change during this period involved the underlying role of the Federal Reserve—that is, the Fed's purpose and objectives. The Fed moved into a new era because of the economic crisis of the Great Depression, the changing view of the role of government policy after this collapse (discussed in Chapter 1), and the new legislation that broadened its powers. The Federal Reserve System became a full-fledged central bank. Now more than a bank for banks, it was charged with contributing to the attainment of the nation's economic and financial goals. More specifically, it was to regulate and supervise the operation of the financial system in order to (1) foster a smooth-running, efficient, competitive financial system and (2) promote the overall health and stability of the economy through its ability to influence the availability and cost of money and credit. Let us first identify the major parts of the Federal Reserve System and then discuss its functions.

Board of Governors
The seven governors of the Fed appointed by the president with Senate approval for 14-year terms.

The core of the Federal Reserve System is the **Board of Governors,** located in Washington, D.C. The board consists of seven members appointed by the president with the advice and consent of the U.S. Senate. See "A Closer Look" on page 189 for brief biographical sketches of the board members as of January 2009. The full term of a board member is 14 years, and the terms are arranged so that one expires every two years. The long tenure and staggered terms were designed to insulate the board from day-to-day political pressures and encourage the members to exercise the same independent

The Board of Governors

- Chair Ben S. Bernanke (b. 1953). Took office on February 1, 2006, for a four-year term as chair; appointed to a full 14-year term on the board in February 2006; previously served on the board from 2002 to 2005.

  Background: Academics and government; served as chair of the President's Council of Economic Advisers from June 2005 to January 2006; professor of economics and public affairs, Princeton University, 1985 to 2002; assistant and associate professor of economics, Graduate School of Business at Stanford University, 1979 to 1985; visiting scholar at the Federal Reserve Banks of Philadelphia (1983–89), Boston (1989–90), and New York (1990–91, 1994–96); member of the Academic Advisory Panel of the New York Fed, 1990 to 2002; Ph.D. in economics from Massachusetts Institute of Technology, 1979.

- Donald L. Kohn (b. 1942). Took office in August 2002 to fill a full term ending January 31, 2016. Appointed to a four-year term as vice chair on June 23, 2006.

  Background: Public service at the Fed; staff adviser to the Board for Monetary Policy, 2001 to 2002; secretary of the Federal Open Market Committee, 1983 to 2002; director of the Division of Monetary Affairs, 1983 to 2001, and deputy staff director for Monetary and Financial Policy, 1983 to 1983; associate director, Federal Reserve Board's Division of Research and Statistics, 1981 to 1983; chief of capital markets, Federal Reserve Board's Division of Research and Statistics, 1978? to 1981; and economist, Federal Reserve Board's Division of Research and Statistics, 1975 to 1978; financial economist, Federal Reserve Banks of Kansas City, 1970 to 1975;? Ph.D. in economics from the University of Michigan, 1971.

- Kevin M. Warsh (b. 1970). Took office in February 2006 to fill an unexpired term ending January 2018.

  Background: Government and business; special assistant to the president for Economic Policy and executive secretary of the National Economic Council from 2002 until February 2006; member, executive director, and vice president of the mergers and acquisitions department of Morgan Stanley & Co. in New York; Juris Doctorate from Harvard Law School, 1995.

- Elizabeth A. Duke (b. 1952). Took office August 2008 to fill an unexpired term ending July 2012.

  Background: Business; senior executive vice president and chief operating officer of TowneBank, a Virginia-based community bank; executive vice president at Wachovia Bank and SouthTrust Bank; president and chief executive officer of Bank of Tidewater, Virginia Beach, Virginia; member of the Board of Directors of the American Bankers Association, 1999–2006; Chair of the Board of Directors of the American Bankers Association, 2004–2006; various civic positions; M.B.A. from Old Dominion University; graduate of the Stonier Graduate School of Banking and the Virginia Bankers School of Bank Management.

- Daniel K. Tarullo (b. 1952). Took office in January 2009 to fill an unexpired term ending January 31, 2022.

Background: Academics and government; professor of law at Georgetown University Law Center; from 1993 to 1998 served as Assistant Secretary of State for Economic and Business Affairs, Deputy Assistant to the President for Economic Policy, and Assistant to the President for International Economic Policy; Chief Counsel for Employment Policy on the staff of Senator Edward M. Kennedy; worked in the Antitrust Division of the Department of Justice and served as Special Assistant to the undersecretary of Commerce; taught at Harvard Law School from 1981 to 1987; Juris Doctorate from the University of Michigan Law School.

Note that at the start of the new Obama administration in late January 2009, there were two vacancies on the Board of Governors.

judgment that Supreme Court justices employ. In theory, a president would be able to appoint only two of the seven members on the board during a four-year term. In actuality, early resignations of board members have permitted recent presidents to name more than two new board members during a four-year term. We might also note that although board members cannot be reappointed if they serve a full term, they may be reappointed if the initial appointment was to fill an unexpired term due to an early resignation. Board members can be removed from office only under extraordinary circumstances. So far, it has never happened.

The president, with the advice and consent of the Senate, appoints one of the seven board members to be the chair for four years and another to be vice chair. The choice of the board chair is crucial, for experience shows that he becomes the chief spokesperson for the Fed and thus a strong force in U.S. economic policy making.[1]

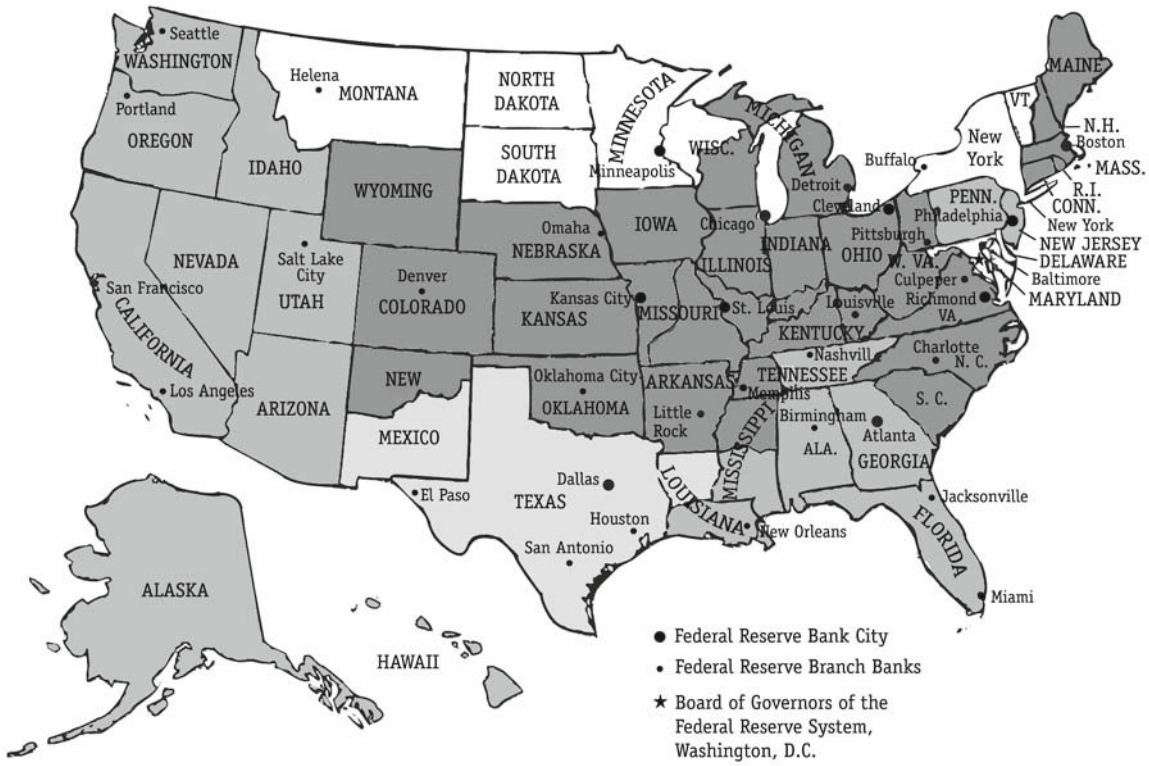
Federal Reserve Banks

Reserve Bank
One of the 12 Federal Reserve Banks; each is located in a large city in its district.

The original Federal Reserve Act divided the nation into 12 districts. Each Federal Reserve Bank district is served by a **Reserve Bank** located in a large city in the district. Thus, as shown in Exhibit 9-1, we have the Federal Reserve Banks of Boston, New York, Philadelphia, Richmond, Cleveland, Atlanta, Chicago, Dallas, Kansas City, St. Louis, Minneapolis, and San Francisco. The three largest are the Reserve Banks of New York, Chicago, and San Francisco, which account for more than 50 percent of Fed assets. The 12 Reserve Banks have a total of 25 branches, located in major cities in the respective district. For example, the St. Louis Fed has branches in Memphis, Tennessee, Little Rock, Arkansas, and Louisville, Kentucky, while the Dallas Fed has branches in Houston, San Antonio, and El Paso, Texas. As we shall see in Chapter 15, all commercial banks that are federally chartered national banks must join the Federal Reserve System. State-chartered banks may join or not join as they choose. The member banks within a Reserve Bank district (say, the Boston district) elect six of the nine directors of that Reserve Bank, and the Board of Governors appoints the other three. These directors, in turn, appoint the president and other officials of that Reserve Bank.

The reason the original Federal Reserve Act created 12 Reserve Banks and provided for the election of directors by member commercial banks was to decentralize policy-making authority.[2] Considerable anti-Federalist sentiment existed in Congress at the time. Over time, the desire to decentralize authority has been stymied by the increased concentration of policy-making authority in Washington.

9-1
The Federal Reserve System



Source: The Federal Reserve System: Purposes and Functions (Washington, DC: Board of Governors of the Federal Reserve System, 1984).

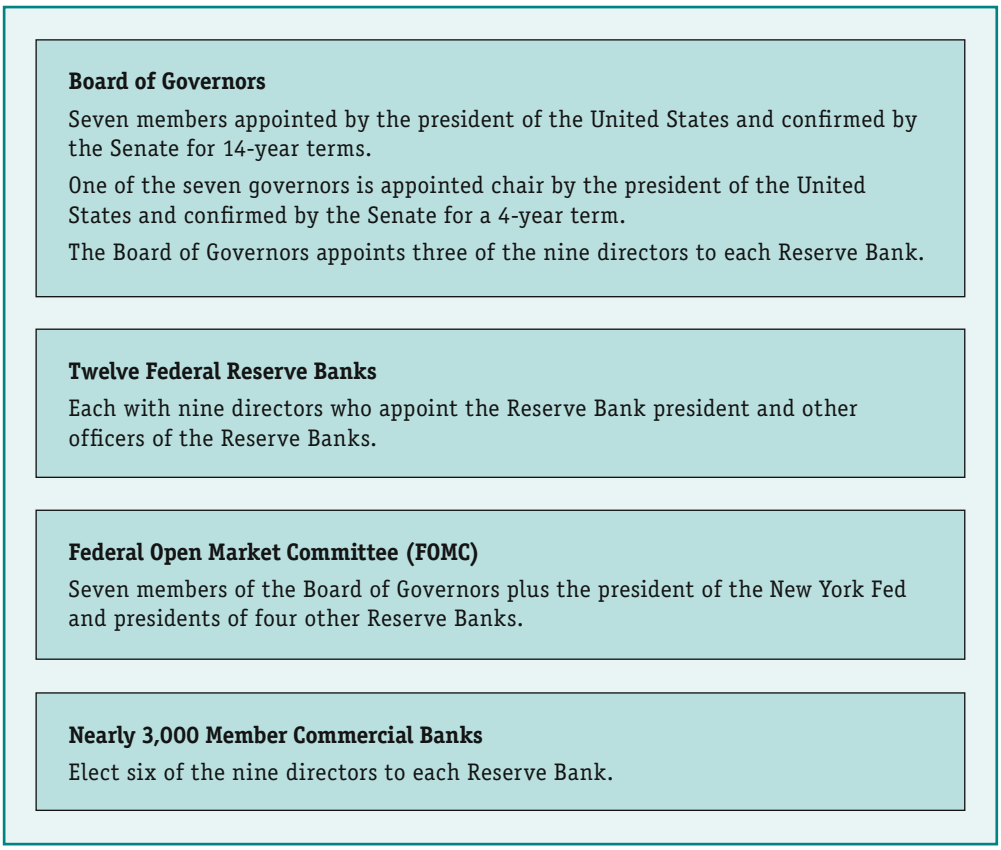
Federal Open Market Committee (FOMC)

Federal Open Market Committee (FOMC)
The principal policy-making body within the Federal Reserve System.

The **Federal Open Market Committee (FOMC)** is the principal policy-making body within the Federal Reserve System. The FOMC formulates monetary policy and oversees its implementation. The committee has 12 members including all seven members of the board and five of the 12 Federal Reserve Bank presidents. The president of the New York Federal Reserve Bank always sits on the FOMC and is a permanent voting member. This is so because the New York Fed, as we shall see, implements monetary policy in accord with the FOMC's instructions. The remaining four seats are filled by the other Reserve Bank presidents who serve one-year terms on a rotating basis. Although only five Reserve Bank presidents have voting rights on the FOMC at any one time, all 12 presidents and their senior advisers attend FOMC meetings and participate in the discussions. By law, the FOMC determines its own internal organization. By tradition, it elects the chair of the Federal Reserve Board as chair of the FOMC, and the president of the New York Federal Reserve Bank as vice chair of the FOMC.

The FOMC gathers in closed meetings in Washington eight times a year (about every six weeks). At these meetings, the FOMC reviews current economic conditions,

9-2
The Organizational Structure of the Federal Reserve System



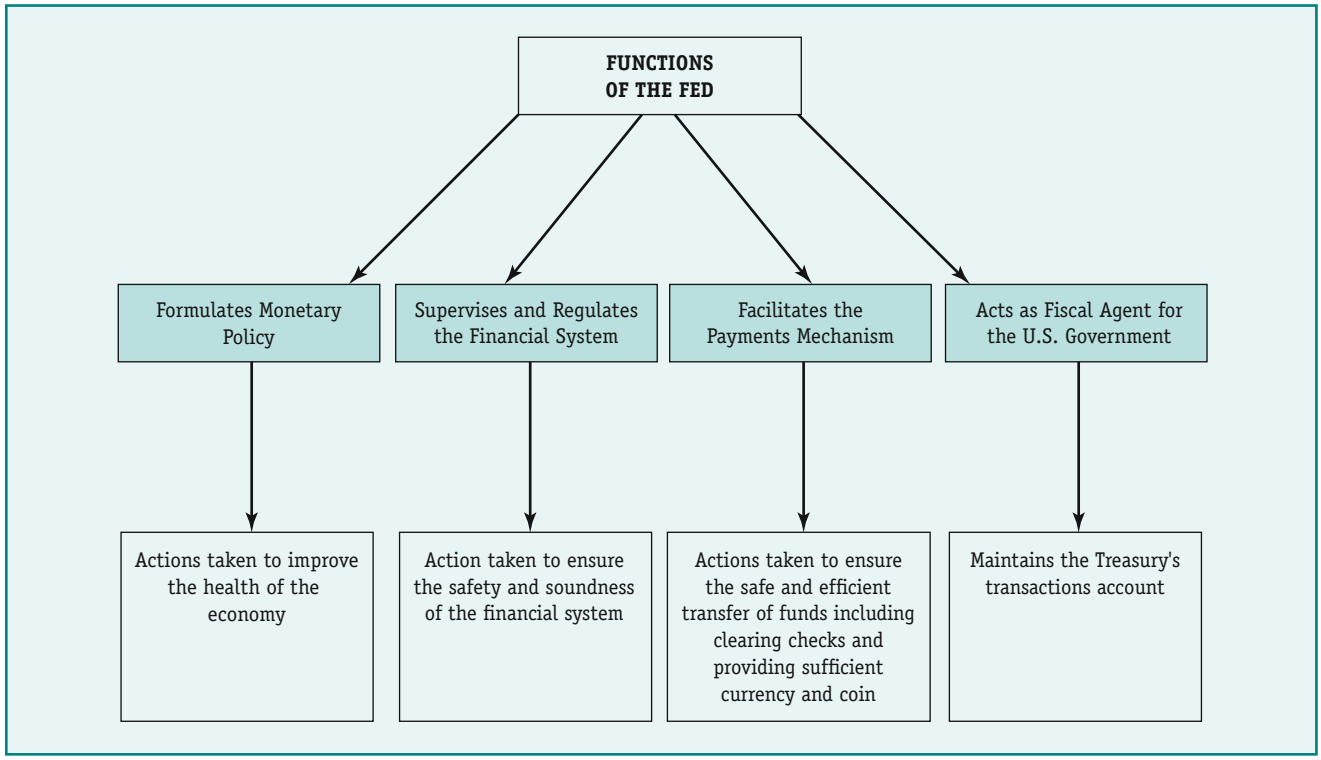
determines the appropriate stance of monetary policy, and evaluates the risks to its goals of price stability and sustainable economic growth. Included in the minutes of an FOMC meeting is the **policy directive,** which is usually a two- to four-paragraph statement.[3] This statement represents a digest of the meeting, indicates the policy consensus of the FOMC, and sets forth the operating instructions (or directive) to the Federal Reserve Bank of New York regarding the conduct of monetary policy.

Policy Directive
A statement of the FOMC that indicates its policy consensus and sets forth operating instructions regarding monetary policy.

Since January 2005, minutes of an FOMC meeting are published three weeks after the meeting, but interested parties do not have to wait for their release to find out what the Fed intends to do. In early 1994, the Fed began announcing policy changes made at FOMC meetings immediately following their conclusion. In addition to any policy change, the Fed also makes a statement about what they believe the direction of the economy to be with regard to inflation and economic growth. These changes have removed some of the secrecy that previously surrounded the specific contents of the meetings.

In the next section, we look at what the Fed is charged with doing. Before moving on, however, take a look at the outline of the Fed's organizational structure in Exhibit 9-2.[4]

Recap The Federal Reserve System was created in 1913. It consists of 12 Reserve Banks. The Fed is governed by the Board of Governors, whose seven members are appointed by the president to 14-year terms. The board chair is appointed to a four-year term. The FOMC is the major policy-making body. It includes the seven Fed governors plus five Reserve Bank presidents. The presi-



dent of the New York Reserve Bank is a permanent member of the FOMC, and the other four slots rotate yearly among the remaining 11 Reserve Bank presidents.

THE FED'S FUNCTIONS

Since its inception, the Fed's powers and responsibilities have gradually expanded. The current list of the Fed's responsibilities can be divided into four functional areas, depicted in Exhibit 9-3, and outlined in the following text.

Formulation and Implementation of Monetary Policy

Monetary Policy
The attempts by the Fed to stabilize the economy and to ensure sufficient money and credit for an expanding economy.

A primary responsibility of the Federal Reserve is the formulation and implementation of the nation's **monetary policy.** The conduct of monetary policy has two objectives: first, to ensure that sufficient money and credit are available to allow the economy to expand along its long-term potential growth trend under conditions of relatively little or no inflation; second, in the shorter run, to minimize the fluctuations—recessions or inflationary booms—around the long-term trend.

In general, the Fed takes actions to affect the cost and availability of funds in the financial system.[5] More specifically, the Fed's actions have a direct effect on the ability of depository institutions to extend credit, on the nation's money supply, and on interest rates. The key point here is that what the Fed does, or fails to do, has a pervasive effect on the environment in the financial system and the overall health and performance of

the economy. For example, by taking actions that increase the availability of funds, the Fed may bring about an expansion of the money supply and, in the short run, a decline in interest rates, or it can do the reverse. Its actions may, in turn, affect the spending, producing, borrowing, lending, pricing, and hiring decisions made in the rest of the economy.

Supervision and Regulation of the Financial System

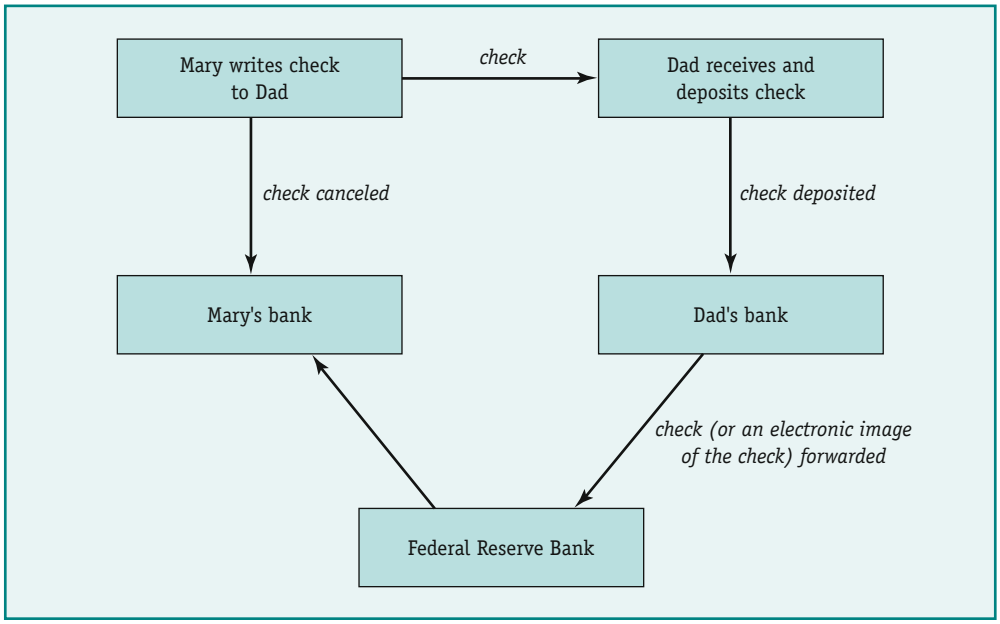
The Fed, along with several other government agencies, is responsible for supervising and regulating the financial system.[6] In general, supervisory activities are directed at promoting the safety and soundness of depository institutions. From the Fed's perspective, this involves continuous oversight to ensure that banks are operated prudently and in accordance with statutes and regulations. Operationally, this means the Fed sends out teams of bank examiners (auditors) to assess the condition of individual institutions and to check compliance with existing regulations. On a more regular basis, banks must submit reports of their financial conditions and activities.

Regulation involves the formulation and issuance of specific rules that govern the structure and conduct of banking. The purpose of the rules is to establish a framework for bank behavior that fosters the maintenance of a safe and sound banking system and the fair and efficient delivery of services to bank customers. Among other things, the regulations (1) define which activities are permissible and which are not, (2) require banks to hold reserve assets equal to a fraction of deposit liabilities, (3) require banks to submit branch and merger applications to the Fed for approval, and (4) try to ensure that consumers are treated fairly when they engage in financial transactions. In recent years, banking has become more globalized. Many large banks have merged with other banks and other financial institutions such as securities firms and insurance companies to form very large conglomerate banking firms. The regulation and supervision of these complex firms is challenging for the Fed. In later chapters, we shall see how the rules and regulations have changed over time as the banking environment changes, and the implications of these changes.

With regard to consumers being treated fairly, the Fed is charged with ensuring that financial institutions comply with the Truth in Lending Act, the Fair Credit Billing Act, and the Equal Credit Opportunity Act. These statutes are designed to protect the customers of financial institutions from discrimination on the basis of race, sex, or age and from unfair or misleading lending practices. In addition, the Fed is responsible for ensuring compliance with the Community Reinvestment Act,[7] which seeks to increase the availability of credit to economically disadvantaged areas and to ensure nondiscriminatory lending practices. To carry out these responsibilities, the Fed monitors the advertising by institutions, investigates complaints from customers, reviews standard loan contracts used by institutions, and requires institutions to submit numerous reports summarizing their lending activities.

Another example of the Fed's supervisory and regulatory activities occurs when a bank encounters serious difficulties and is in danger of failing. The cause of the problem may be—and often is—related to fraudulent or misguided lending practices. Whatever the case, the Fed, along with the other relevant government agencies, tries to find an orderly solution that will preserve the public's confidence in the financial system. Often this has involved finding a merger partner for the weak or failing institution, lending funds to the institution to give it time to work out its problems, and in extreme cases, removing the bank's management.

9-4
The Check-Clearing System



Facilitation of the Payments Mechanism

Payments Mechanism
The ways in which funds are transferred to make payments.

The **payments mechanism** is at the heart of the nation's financial system. Billions of dollars are transferred each day to pay for goods and services, settle debts, and acquire securities. Because any disruption of this mechanism could prove deleterious to the economy, the Fed is committed to the development and maintenance of safe and efficient means for transferring funds—that is, making payments.

Most obviously, the Fed facilitates the transfer of funds by providing currency and coin and clearing checks. As of late 2008, the value of currency (Federal Reserve notes) and coins in circulation was about $780 billion. As Exhibit 9-4 illustrates, the Fed plays a central role in the transfer of funds initiated by the writing of a check. The task is enormous. In 2007, the Fed cleared about 29 billion checks with a value over $41 trillion. Since October 2004, banks have been authorized to substitute an electronic image of a check for the actual paper check. Rather than physically transporting the original check, the electronic image can be sent almost instantaneously all over the country with the result being that the check-clearing process is expedited and the costs reduced.

Automated Clearinghouse (ACH)
A function of the Fed that assists the government and private sectors in making automated direct payments of payroll checks into checking accounts, and allows consumers to authorize transfers for insurance premiums, mortgage payments, other bills, and certain online or telephone transfers.

The Fed also participates, along with private sector vendors, in the **automated clearinghouse (ACH)** function, which assists the government and private sectors in making automated debits and credits. Developed in the 1930s primarily as a way to disperse social security payments and salaries to government workers, the ACH continues to evolve into other government and private sector uses. The ACH is used by employers to make direct payments of payroll checks into checking accounts, and by consumers to authorize transfers for insurance premiums, mortgage payments, other bills, and certain online or telephone transfers. In 2006, private sector payments were about six times the value of government payments. In total, 14.6 billion ACH payments were made that year with a value of almost $31 trillion.

Fedwire
An electronic system for irrevocably and instantaneously transferring very large sums of funds (wholesaling funds) among about 9,500 Fedwire participants, which are generally very large institutions.

The Fed also operates **Fedwire,** an electronic system for transferring very large sums of funds (wholesaling funds) among about 9,500 Fedwire participants, which are

generally very large institutions. Fedwire payments occur in real time, and they are final and irrevocable. Fedwire, which operates 21.5 hours a day, is also used in implementing monetary policy, in buying and selling government securities, and in making international payments. In 2007, about 134 million Fedwire payments were made with a value of over $670 trillion.

By 2006, the number of electronic payments (including debit cards, credit cards, and ACH) was more than twice the number of check payments. Moreover, the relative use of checks continues to decline in favor of some form of electronic transfer, whether it be through the use of ACH, online or offline debits, or through the use of a credit card.

Operation as Fiscal Agent for the Government

As chief banker for the U.S. government, the Fed furnishes banking services to the government in a manner similar to the way private banks furnish banking services to their customers. For example, the Fed maintains the U.S. Treasury's transactions account.[8] Government disbursements, such as funds for the purchase of a missile, are made out of this account, and payments to the government, such as taxes, are made into this account. The Fed also clears Treasury checks, issues and redeems government securities, and provides other financial services. It acts as the fiscal agent of the government in financial transactions with foreign governments and foreign central banks.

Finally, we would be remiss if we did not tell you about a proposal by the U.S. Treasury in March 2008 to overhaul the financial regulatory structure. Under the proposal, the power of the Fed would be greatly expanded to include the regulation of nonbank financial institutions. In addition to regulating the banking system, the Fed's new powers would include oversight of any financial institution or market whose financial practices could pose a threat to the financial system or the economy. Such institutions include insurance companies, hedge funds, pension plans, mutual funds, private equity firms, and virtually any other large financial institution whose failure might cause catastrophic effects. The purpose of this would be to prevent a nonbank financial institution from taking excessive risks if its failure would drag the entire economy down. Thus, if the proposal is adopted, the functions of the Fed will be expanded to include oversight of any financial institution whose failure would pose such a threat. We cover the details of the proposed overhaul in Chapter 17. It is expected that any changes to the current regulations and functions of the Fed will not be adopted for at least the next several years. However, the ongoing financial crisis involving the collapse, government bailout, or severe strains of such firms as Countrywide Bank, Indy Mac Bank, Bear Stearns, Lehman Brothers, Merrill Lynch, Fannie Mae, Freddie Mac, American International Group (AIG), and Washington Mutual will undoubtedly hasten the overhaul of the regulatory structure. Finally, the unprecedented government bailout of the financial system which Congress approved in late September 2008 and the proposed additional bailout by the Obama administration will bring much greater focus and attention to a plan to reform the regulatory structure.

The next section focuses on the tools the Fed has at its disposal to fulfill those responsibilities.

Recap The major responsibilities of the Fed include setting monetary policy, regulating and supervising the financial system, facilitating the payments mechanism, and acting as fiscal agent for the U.S. government.

The Eurosystem: Europe's Central Bank

The European Union consists of 27 European countries that seek greater economic and monetary integration. Twelve of the 27 member countries have adopted a single currency called the *euro*. It replaced the national currencies such as the French franc, German mark, and Italian lira of the respective countries. The conversion began on January 1, 1999, and was completed on March 1, 2002.[1]

The Eurosystem is made up of the European Central Bank (ECB) and the national central banks of the 12 countries in the currency union. The ECB, created on June 1, 1998, has capital of 5 billion euro, which has been contributed on a pro rata basis by the national central banks. The Eurosystem formulates and implements monetary policy for the euro zone and is independent of control by any member country. In addition to directing monetary policy, the Eurosystem conducts foreign exchange operations and holds and manages the official foreign reserves of member countries. The ECB also operates a payment system called *TARGET*, which interlinks the national payment settlement systems of the countries in the European Union in order to promote smooth operation of the payments system.

The decision-making bodies of the Eurosystem consist of the Governing Council and the Executive Board. The Executive Board consists of the president, the vice president, and four other members, all appointed by the member countries. Minimum nonrenewable terms are eight years. The Governing Council consists of the Executive Board plus the governors of the national central banks of the member countries. A minimum renewable term for governors is for five years. The national central banks of the 12 countries in the currency union continue to perform many day-to-day monetary functions.

By law, the primary objective of the Eurosystem is to maintain price stability in the euro zone. The Eurosystem decides on a quantitative definition of price stability, such as 2 percent inflation or less, that is to be met over a medium time period—such as a few years. In addition, "two pillars" are used to achieve the goal. The first pillar is a quantitative reference value for the growth rate of a broad-based monetary aggregate, such as the M2 in the United States. The second pillar consists of a broad collection of indicators that policy makers consider to assess the outlook for price developments in the area as a whole. The former is similar to targeting a monetary aggregate to guide policy formulation. The latter is similar to using a more eclectic approach in policy formulation.

To achieve its goals, the Eurosystem uses tools similar to the Fed's, including open market operations, a lending facility like the discount window called a *standing facility*, and reserve requirements. The 12 national central banks hold the required reserves, carry out open market operations, and operate the standing facility. The Eurosystem must approve of the financial instruments that are allowed to be used in open market operations; must set reserve requirements and interest rates on standing facility loans; and must take actions that nudge interest rates and the monetary aggregates in one direction or the other as part of monetary policy. In many ways, the

national central banks take on a role similar to the 12 Federal Reserve Banks, and the ECB takes on the role of the Board of Governors and the Federal Open Market Committee of the Federal Reserve System.

Endnotes

1. On May 1, 2004, the EU was expanded from 15 to 25 countries. The original countries were Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, and Sweden. The countries that joined in 2004 included Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia. Of the original 15, Denmark, Great Britain, and Sweden decided not to participate in the euro. The 10 additional countries may participate in the euro at a later date but did not as of 2008. On January 1, 2007, the EU was further expanded from 25 to 27 countries when Bulgaria and Romania were admitted.

THE FED'S MAJOR POLICY TOOLS

Open Market Operations

Open Market Operations
The buying and selling of government securities by the Fed to change the reserves of depository institutions.

Open market operations represent the most important monetary policy tool at the Fed's disposal. These operations, which are executed by the Federal Reserve Bank of New York under the guidance and direction of the FOMC, involve the buying or selling of U.S. government securities by the Fed. When the Fed buys securities, reserves rise, and when the Fed sells securities, reserves fall. These operations are important because they have a direct effect on the reserves that are available to depository institutions. (Recall from Chapter 2 that depository institutions are required to hold reserve assets equal to a certain proportion of outstanding deposit liabilities.) Changes in reserves, in turn, affect interest rates and the ability of depository institutions to make loans and to extend credit. When banks or other depository institutions make loans, they create checkable deposits. Thus, changes in reserves also affect the money supply.

Since the mid-1990s, the Fed uses the fed funds rate in the implementation of monetary policy. The Fed sets a target for the fed funds rate that it believes will result in a structure of interest rates—and subsequently a level of spending and borrowing—consistent with the Fed's goals for the economy. The Fed then uses open market operations to affect the supply of reserves and the reserves market so that the actual fed funds rate is equal to or very close to the targeted fed funds rate. For example, if the actual fed funds rate, as determined by supply and demand, is higher than the targeted rate, the Fed will supply reserves, causing the rate to fall, and vice versa.

The Discount Rate and Discount Rate Policy

Because the Fed controls the amount of required reserve assets that depository institutions must hold, it also operates a lending facility called the *discount window* through which depository institutions in need of reserves can borrow from the Fed. It is through the discount window that the Fed fulfills its function as a "lender of last resort." In January 2003, a new policy was implemented that established primary, secondary, and seasonal credit programs for discount window borrowing. Each program has its own interest rate, but the bulk of the borrowing and lending is in the primary credit program at the primary credit rate.

Primary Credit Rate
The rate for short-term borrowing of reserves by the healthiest depository institutions from the Fed, also known as the discount rate.

Discount Rate
The rate that healthy depository institutions are charged for short-term borrowing of reserves from the Fed. Today, the primary credit rate is referred to as the discount rate.

Secondary Credit Rate
The rate for short-term borrowing of reserves from the Fed by depository institutions experiencing financial difficulties.

Under the primary credit program, loans are made to depository institutions that are healthy and sound. The loans in this program may be used to cover shortfalls of reserves or to expand credit. The **primary credit rate** was originally set by the Fed one percent above the targeted fed funds rate, which, as noted in the previous section, the Fed influences through open market operations. Because the primary credit rate is set above the fed funds rate, banks under normal conditions will not borrow at the discount window but rather in the fed funds market, where borrowing is cheaper. However, in the event of a liquidity shortage in the banking system, funds would be available at the discount window. It is the primary credit rate that today is often referred to as the **discount rate.** Going along with the colloquial use, when we use the term *discount rate* throughout the text, we mean the primary credit rate. The primary credit rate was maintained one percent above the fed funds rate until August 17, 2007. On that date, the Fed lowered the spread between the *primary credit rate* and the fed funds rate to 0.5 percent. In addition, banks were encouraged to borrow at the discount window by the Fed. These actions were taken due to deterioration in credit markets because of a financial crisis in the housing sector. (More on this crisis in Chapters 10 and 21).

Under the secondary credit program, loans are made to depository institutions that are having financial difficulties. The interest rate charged is called the **secondary credit rate,** and in mid-2008 it was set 0.5 percent higher than the primary credit rate. The loans can only be used to cover shortfalls of required reserves, not to expand credit. Since the secondary credit rate is higher than the primary credit rate, banks in this classification are charged a penalty rate for having financial troubles.

Seasonal credit is extended to small depository institutions that have recurring seasonal funding needs such as banks in agricultural or seasonal resort communities. The loans in this program allow the institutions to minimize their holdings of excess reserves throughout the year, despite seasonal needs. When the seasonal need arises, banks can borrow reserves in this program rather than holding quantities of excess reserves throughout the year or liquidating assets to meet seasonal needs. The seasonal credit rate is an average of various CD rates and the fed funds rate.

Prior to January 2003, the discount rate was set by the Board of Governors, and changes to it often lagged behind changes in other interest rates, particularly short-term rates. The discount rate now automatically responds to changes in the targeted fed funds rate, thus eliminating the lag.

Changes in the discount rate can have several possible effects on depository institution behavior and the economy. The most obvious of these effects is that the cost of borrowing funds (reserves) from the Fed changes. Increases in the discount rate raise the cost of borrowing, and decreases lower it. Occasionally, "exceptional circumstances" such as a crisis in the housing market, a natural disaster, a terrorist attack, the shutdown of a large manufacturer in a small community, or other developments over which an institution's management has no control may adversely affect an individual institution or the banking system as a whole. Borrowers may not be repaying existing loans, depositors may be withdrawing large amounts of funds, and fears over the safety and solvency of an institution may be growing.

In such circumstances, as they emphasized in August 2007, the Fed stands ready to be a lender of last resort through the primary and secondary credit programs. The Fed's willingness to be a lender of last resort is closely related to its regulatory and supervisory responsibilities and its overall desire to preserve the public's confidence in the safety and soundness of the financial system, in general, and depository institutions, in particular.

Reserve Requirements

Required Reserves
The amount of reserve assets that the Fed requires depository institutions to hold against outstanding checkable deposit liabilities.

Required Reserve Ratio
The fraction of deposit liabilities that must be held as reserve assets.

The major item on the liability side of depository institutions' balance sheets is deposits. The Fed requires depository institutions to hold **required reserves** equal to a proportion of checkable deposit liabilities. The Fed specifies the **required reserve ratio,** which is the fraction that must be held. Currently, the Fed is authorized to set the required reserve ratio anywhere between 8 and 14 percent. For example, if the required reserve ratio on checkable deposits is 10 percent, then for each $1.00 in checkable deposit liabilities outstanding, a depository must hold $.10 in reserve assets. During 2008, the required reserve ratio was 0 percent on the first $10.3 million of checkable deposits, 3 percent on checkable deposits of more than $10.3 million and less than $44.4 million, and 10 percent thereafter. For simplicity, we ignore the 0 and 3 percent requirements.[9] Beginning in October 2008, the Fed began paying interest on reserve balances of depository institutions in response to the ongoing financial crisis of 2008–2009.

There are no reserve requirements on time and savings deposits, although such requirements have often been imposed in the past. Rather than frequently changing the required reserve ratio, which can be disruptive to financial institutions, the Fed uses open market operations as its major instrument for implementing monetary policy.

Sweep Accounts
A financial innovation that allows depository institutions to shift customers' funds out of checkable accounts that are subject to reserve requirements and into highly liquid money market deposit accounts (MMDAs) that are not.

In recent years, the amount of required reserves held by banks and other depository institutions has fallen dramatically because of the introduction and growth of sweep accounts. A **sweep account** is a financial innovation that allows depository institutions to shift customers' funds out of checkable accounts that are subject to reserve requirements and into highly liquid money market deposit accounts (MMDAs) that are not. For example, funds that were "swept" out of checkable deposits and into MMDAs totaled $5.3 billion in January 1994, when they were first tracked by the Fed. By July 2006, the cumulative funds in retail sweep accounts was over $320 billion. Some analysts have expressed concern that the reduction in required reserves resulting from the growth of sweep accounts will make it more difficult for the Fed to implement monetary policy. The evidence does not seem to support this concern. Sweep accounts are discussed in greater depth in later chapters.

Given the major policy tools of the Fed, the Board of Governors determines the reserve requirements and the primary credit and secondary credit rates. They also supervise and regulate the banking system. The FOMC, made up of mostly the Board of Governors, directs open market operations and determines monetary policy.

Clearly, the board swings the most weight within the Federal Reserve System—and most observers agree that the chair swings the most weight on the board and is a powerful figure in U.S. policy circles. The board exercises general supervisory and budgetary control over the 12 Reserve Banks. The Reserve Banks deal directly with depository institutions and administer discount policy. In addition, they are an important part of the nation's check-clearing system and play a key educational role by providing financial institutions and the public with information on Fed policy and the workings of the financial system and the economy. Also note that to help deal with the crisis, the Fed temporarily expanded its tools from the traditional ones we cover here. We look in more detail at these new actions taken by the Fed in Chapter 10.

Recap The Fed's main tools for implementing monetary policy are open market operations and setting the required reserve ratio and the discount rate. Open market operations are the most widely used tool.

Looking Back

Early Attempts at Establishing a Central Bank

The creation of the Fed in 1913 was not the first attempt to establish a central bank in the United States. Indeed, the first effort occurred back in 1791, when the Bank of the United States was given a 20-year charter with the government providing one-fifth of the start-up capital. The fledgling bank had elements of both a private and a central bank. Like other private banks, it made loans to businesses and individuals. Like a central bank, it issued banknotes backed by gold, attempted to control the issuance of state banknotes, acted as fiscal agent for the government, and was responsible for the aggregate quantity of money and credit supplied in the economy. However, the bank was not without its detractors, who alleged that it represented big city "moneyed" interests. Fear and distrust, the unpopularity of centralized power, and questions about the bank's constitutionality all contributed to pressures to dissolve the bank. Its charter was allowed to run out in 1811.

The war of 1812 brought renewed pressures for a central bank that could oversee the financing of the war. Congress chartered the Second Bank of the United States in 1816. This bank also acted as fiscal agent for the U.S. government and issued banknotes redeemable in gold. Friction persisted between those who wanted a strong central bank (Federalists) and those who supported a more decentralized system (anti-Federalists). After substantially reducing the bank's powers in the early 1830s, President Andrew Jackson vetoed the rechartering of the bank, and it went out of existence in 1836.

The National Banking Acts of 1863 and 1864 succeeded in establishing a uniform national currency, but the lack of a central bank meant that there was no easy way to regulate the amount of currency in circulation. Consequently, the country experienced periodic shortages that often led to financial crises. Such crises occurred in 1833, 1884, 1893, and 1903. Nevertheless, attempts at creating a central bank that could regulate the amount of currency in circulation were not successful until 1913, when the Fed was established.

The Federal Reserve System and the Question of Central Bank Autonomy

The Federal Reserve System is a quasi-government agency whose primary responsibility is to stabilize the economy. As explained earlier, Congress established the Federal Reserve as an independent agency to shield it from political pressures. The 14-year terms of the members of the board ensure that the members do not have to defend their actions to Congress, the president, or the public. In addition, the Fed does not depend on an appropriation from Congress for its funding. The Fed pays its own way from the interest income it earns on its holdings of government securities and its loans to depository institutions. Finally, the Fed is exempt from many provisions of the

Freedom of Information Act (1966)
A 1966 law that requires more openness in government and more public access to government documents.

Freedom of Information Act (1966) and "government in the sunshine" legislation, which call for government policy to be made in meetings open to the public. As a result, Fed policy makers usually meet in secret to formulate policy.

Nevertheless, the Fed is not completely outside the government. In the short run, its decisions regarding monetary policy are, in theory, not constrained by the whims of the president or Congress or by any partisan politics. However, in the long run, Congress can pass laws that the Fed must obey, or it could even abolish the Fed altogether.

Those who support Fed independence do so mainly on the grounds that anything less than independence will inject politics into monetary policy operations. This argument was put forth eloquently by Alan Greenspan, former chair of the Board of Governors:

> We have to be sensitive to the appropriate degree of accountability accorded a central bank in a democratic society. If accountability is achieved by putting the conduct of monetary policy under the close influence of politicians subject to short-term election-cycle pressures, the resulting policy would likely prove disappointing over time. That is the conclusion of financial analysts, of economists, and of others who have studied the experiences of central banks around the globe, and of the legislators who built the Federal Reserve. The lure of short-run gains from running the economy can loom large in the context of an election cycle, but the process of reaching for such gains can have costly consequences for the nation's economic performance and standards of living over the longer term. The temptation is to step on the monetary accelerator, or at least to avoid the monetary brake, until after the next election. Giving in to such temptations is likely to impart an inflationary bias to the economy and could lead to instability, recession, and economic stagnation. Interest rates would be higher, and productivity and living standards lower, than if monetary policy were freer to approach the nation's economic goals with a longer term perspective.[10]

Macroeconomic research tends to support Greenspan's views on central bank autonomy. As in the United States, almost all directors of foreign central banks are appointed by the government. Their terms, however, are often considerably shorter than the 14-year term of Fed governors. The shorter the term, the less independent the central bank is. In some countries, government officials actually sit on the governing board, central banks are mandated by law to give credit to the government, and politicians can easily replace central bank governors. In others, it may not be so easy.

By considering these factors, researchers have judged the independence of various central banks and found that inflation rates are lowest in countries with the most independent central banks.[11] Apparently, the more independent the central bank is, the less likely it is to expand (inflate) the economy in response to political pressure. Evidence also suggests that countries with the most independent central banks do not have higher long-run rates of unemployment. Thus, on both the inflation and the unemployment front, an independent central bank appears to enhance macroeconomic performance.

Despite the perceived advantages of an independent central bank, many people contend that the independence of the Fed is inconsistent with democracy. They argue that the president and Congress are held accountable for economic conditions. If unemployment is rising and inflation is rampant, the president and members of Congress will be driven from office at election time. Because the president and Congress are

responsible for economic policy, they should have all the tools at their disposal. More generally, opponents of Fed independence argue that monetary policy, like other government policies, should be controlled by people directly responsible to the electorate.

In response to concerns about too much Fed autonomy and to facilitate the implementation of monetary policy, the Fed has become considerably more open in recent years. For example, even though it has no legislative requirement to do so, the FOMC releases edited minutes of its deliberations three weeks after meetings. As previously discussed, since 1994, the Fed announces policy changes immediately after the FOMC meetings rather than waiting for the publication of minutes and the policy directive, or for the policies to be implemented. Back in 1993, the Fed agreed to publish "edited" transcripts, not just minutes, of the FOMC meetings with a five-year delay.[12] And in February 2000, the FOMC amended the language in the announcement to more clearly communicate its judgment of the economic outlook in the foreseeable future. All of these actions confirm that the Fed is more open than in the past, while maintaining that the present system gives it the proper degree of accountability necessary to carry out monetary policy.

Recap

The Fed is a quasi-independent government agency set up to be somewhat autonomous and shielded from political pressures. If subject to political pressures, the Fed could pursue policies that would be politically advantageous in the short run but detrimental in the long run. Research shows that countries with the most autonomous central banks have the lowest inflation rates. The Fed has become more open in recent years.

In the next chapter, we look at the nuts and bolts of monetary policy.

Summary of Major Points

1. The Federal Reserve System was established by an act of Congress in 1913. The original Federal Reserve Act was modified and strengthened in 1933 and 1935, following the economic and financial collapse during the Great Depression.
2. The Fed is charged with regulating and supervising the operation of the financial system to keep it running smoothly and efficiently, and with promoting the overall health and stability of the economy through its ability to influence the availability and cost of money and credit.
3. The Board of Governors, located in Washington, D.C., is the core of the Federal Reserve System. It is composed of seven members appointed by the president, with the approval of the Senate, for 14-year terms. The president appoints one of the governors as chair for a four-year term.
4. The country is divided into 12 districts. Each district is served by a Reserve Bank located in a large city within the district.
5. The Federal Open Market Committee (FOMC) is the chief policy-making body within the Fed. It is composed of 12 members: the seven members of the Board of Governors and five of the 12 presidents of the Reserve Banks. The president of the New York Federal Reserve Bank is a permanent voting member, and the other four slots rotate yearly among the remaining 11 Reserve Bank presidents.

6. The Fed's functions can be classified into four main areas: formulating and implementing monetary policy; supervising and regulating the financial system; facilitating the payments mechanism; and acting as fiscal agent for the government.
7. The FOMC directs open market operations, the major tool for implementing monetary policy. These operations involve the buying or selling of government securities—actions that affect the volume of reserves in the banking system as well as interest rates. When the Fed buys securities, bank reserves increase. This, in turn, encourages bankers to expand loans and, hence, the money supply.
8. The FOMC meets eight times each year in closed meetings in Washington. Policy changes are announced immediately after the meetings. The minutes of the FOMC meetings are released to the public three weeks later. They contain the policy directive, which is the set of instructions regarding the conduct of open market operations that is issued to the New York Fed. The New York Fed executes open market operations on behalf of the FOMC and the entire Federal Reserve System. The Fed currently targets the fed funds rate and uses open market operations to keep that rate close to or at the target. The Fed announces FOMC decisions immediately following the meeting, including a statement about its judgment about the economic outlook in the foreseeable future.
9. In January 2003, the Fed established primary, secondary, and seasonal credit rates for discount window borrowing of reserves from the Fed. The primary credit rate is for short-term borrowing by healthy financial institutions. The secondary credit rate is 0.5 percent higher than the primary credit rate and is the rate charged for borrowing reserves by troubled depository institutions. Through discount window borrowing, the Fed is prepared to serve as a lender of last resort.
10. The Fed requires depository institutions to hold reserve assets equal to a proportion of each dollar of deposit liabilities. The Fed's required reserve ratio specifies the proportion.
12. There is an ongoing debate concerning the autonomy of the Fed. The Fed and others argue that independence is essential to the pursuit of economic stability. Without Fed autonomy, politicians would be tempted to take action that benefits the economy in the short run but may hurt the economy in the long run. Opponents argue that such independence is inconsistent with our democratic form of government. In recent years, the Fed has become more open.

Key Terms

Automated Clearinghouse (ACH), p. **195**
Banking Reform Acts of 1933 and 1935, p. **188**
Board of Governors, p. **188**
Discount Rate, p. **199**
Federal Open Market Committee (FOMC), p. **191**
Federal Reserve Act, p. **188**
Federal Reserve System, p. **188**
Fedwire, p. **195**
Freedom of Information Act (1966), p. **202**
Lender of Last Resort, p. **188**
Monetary Policy, p. **193**
Open Market Operations, p. **198**
Payments Mechanism, p. **195**
Policy Directive, p. **192**
Primary Credit Rate, p. **199**
Required Reserve Ratio, p. **200**
Required Reserves, p. **200**
Reserve Bank, p. **190**
Secondary Credit Rate, p. **199**
Sweep Accounts, p. **200**

Review Questions

1. Discuss each of the four major functions of the Fed. Which do you believe requires Fed autonomy? Why?
2. List the major responsibilities of each of the following:
   a. the Board of Governors
   b. the 12 Reserve Banks
   c. the Federal Open Market Committee
3. Why was the Fed created? What effect should the existence of the Fed have on financial crises?

4. Why did Congress create 12 Federal Reserve Banks rather than one central bank?
5. What features of the Fed's structure serve to make it fairly autonomous? Is Congress able to wield any control over the Fed?
6. Why have the responsibilities of the Fed increased since its inception?
7. Discuss the major policy tools that the Fed can use to promote the overall health of the economy. What is the most widely used tool?
8. What are the primary and secondary credit rates? When do they change? How often does the Fed change the required reserve ratio? How often does the Fed engage in open market operations?
9. What are the arguments for increasing the *autonomy* of the Fed? What are the arguments for increasing the *accountability* of the Fed?
10. Suppose that the Fed were less independent. How could this affect monetary policy? Suppose that the Fed were more independent. How could this affect monetary policy?
11. Why is the president of the New York Fed a permanent member of the FOMC?
12. Is the Fed more accountable to Congress or to the president? Why? Who created the Fed? Who appoints the Fed chair?
13. How does each of the following affect the money supply?
    a. The Fed lowers the required reserve ratio.
    b. The Fed buys government securities.
14. What are sweep accounts? How do sweep accounts affect required reserves? Are balances in sweep accounts subject to reserve requirements?

Suggested Readings

For an excellent monetary history and a summary of the events leading up to the legislation establishing the Federal Reserve, see Milton Friedman and Anna Jacobson Schwartz, *A Monetary History of the United States, 1863–1960* (Princeton, NJ: Princeton University Press, 1963).

The concern about political pressure on the central bank was well founded given the early history of banks in the United States. For a relevant discussion, see Bray Hammond, *Banks and Politics in America from the Revolution to the Civil War* (Princeton, NJ: Princeton University Press, 1953).

U.S. Monetary Policy and Financial Markets by Ann-Marie Meulendyke (1998) is a readable discussion of Fed procedures and the conduct of monetary policy. It can be obtained free of charge from the Public Information Dept., Federal Reserve Bank of New York, 33 Liberty Street, New York, NY 10045.

"The Federal Open Market Committee and the Formation of Monetary Policy" features remarks made by Fed governor Susan Schmidt Bies at the Academic Speaker Series, University of Tennessee, Martin, Tennessee, February 3, 2005. See **http://www.federalreserve.gov/boarddocs/speeches/2005/20050207/default.htm.**

"The Role of Federal Reserve Banks in the Federal Reserve System" is a transcript of remarks made by William Poole, president of the Federal Reserve Bank of St. Louis, at the Annual Global Student Investment Forum, University of Dayton, Dayton, Ohio, March 30, 2006. See **http://www.stlouisfed.org/news/speeches/2006/03_30_06.htm.**

Poole's speech "Understanding the Fed," delivered at the Dyer County Chamber of Commerce Annual Membership Luncheon, Dyersburg, Tennessee, August 31, 2006, is also available online at **http://stlouisfed.org/news/speeches/2006/08_31_06.html.**

"Thoughts on Financial Stability and Central Banking" is a transcript of remarks made by Vice Chairman Roger W. Ferguson, Jr., at the Conference on Modern Financial Institutions, Financial Markets, and Systemic Risk, Federal Reserve Bank of Atlanta, Atlanta, Georgia, April 13, 2006. The text is available online at **http://www.federalreserve.gov/newsevents/speech/Kohn20060413a.htm.**

"The Federal Reserve in an Electronic World" is a transcript of remarks made by Governor Mark W. Olson at the 2005 Payments Conference, Federal Reserve Bank of Chicago, Chicago, Illinois, May 19, 2005. The text is available online at **http://www.federalreserve.gov/boarddocs/speeches/2005/200505193/default.htm.**

For an interesting history of the Fed, see James McAfee, "Historical Perspectives on Form and Function," *The Region*, Federal Reserve Bank of Minneapolis (September 2004). The article is also available online at **http://www.minneapolisfed.org/pubs/region/04–09/McAfee.cfm.**

Fedpoints is a reference series explaining the structure and functions of the Federal Reserve System and other relevant economic concepts. It is available online at **http://www.newyorkfed.org/aboutthefed/fedpoints.html.**

"The Independence of Central Banks" by Sun Bae Kim summarizes a study showing that countries with the most independent central banks have the lowest inflation rates. The study suggests that if the central bank has a reputation for controlling inflation, this can substitute for legal independence. The article can be found in the *Weekly Letter of the San Francisco Federal Reserve Bank* (December 13, 1991).

"An Independent Central Bank in a Democratic Country: The Federal Reserve Experience" by William McDonough offers a discussion of the historical development of central banking in the United States. McDonough writes about the need for the Fed to be somewhat independent of the day-to-day control of the government so that it will be less likely to succumb to short-term political pressures. The article can be found in the *Federal Reserve Bank of New York Quarterly Review* 19 (Spring 1994): 1–6.

For general information on the Fed, go to **http://www.federalreserve.gov** and **http://www.minneapolisfed.org/info/sys/.**

For a list of the 12 Federal Reserve Banks and Internet links to each, see **http://federalreserve.gov/otherfrb.htm.**

Minutes of the FOMC meetings are posted at **http://woodrow.mpls.frb.fed.us/info/policy/fomcmin.cfm** and **http://www.federalreserve.gov/fomc/#calendars.**

Information on open market operations can be found at **http://www.federalreserve.gov** or **http://www.newyorkfed.org.**

Endnotes

1. The Board has not yet had a female chair.
2. In addition, no two members of the Board of Governors may come from the same Reserve Bank district. This ensures that the board is not unduly influenced by any particular region of the country.
3. Excerpts from a policy directive are reprinted in Chapter 10.
4. In addition to the organizational structures mentioned in the body of the text, the Fed includes three advisory councils: the Consumer Advisory Council, the Federal Advisory Council, and the Thrift Institutions Advisory Council. Composed of representatives from each Federal Reserve District, they meet several times a year with the Board of Governors to provide advice on issues relating to the Fed's responsibilities in the banking, consumer finance, and depository institutions areas. Federal Reserve insiders say that, as the name suggests, the advisory councils have no real power and serve mainly as a medium for public relations and the exchange of information.
5. The tools the Fed has available to affect the cost and availability of funds are discussed in the next section.
6. Many of the agencies that regulate the financial system are discussed in Chapter 17. Here, it is sufficient for you to know that the Fed has the broadest set of responsibilities, some of which overlap with the activities of other regulatory agencies.
7. The Community Reinvestment Act is discussed in greater detail in Chapter 17.
8. The transactions account of the government held at the Fed is similar to a checking account. However, the balance in the government's transactions account is not included in any monetary aggregate and therefore is not "money."
9. The amount of checkable deposits against which the 3 and 0 percent applies is modified each year depending on the percentage change in checkable deposits. Because $44.4 million in deposits is a relatively small amount, we ignore the 3 and 0 percent requirements. The Fed may also set a required reserve ratio of up to 9 percent on nonpersonal time deposits. Currently, the Fed does not impose reserve requirements on time deposits.
10. Statement by Alan Greenspan before the Committee on Banking, Finance, and Urban Affairs, U.S. House of Representatives (October 13, 1993).
11. In addition to the Sun Bae Kim article in the Suggested Readings, see Alberto Alesina and Lawrence H. Summers, "Central Bank Independence and Macroeconomic Performance," *Journal of Money, Credit, and Banking* 25:2 (May 1993): 151–62. Note that some of the European central banks in these studies are now part of the Eurosystem. These studies pre-

date the formation of the European Central Bank. However, they were used as resources in determining the structure that the new central bank should take with regard to central bank independence.

12. The editing of the transcripts usually involves deleting a small amount of confidential material that pertains to foreign central banks or entities.

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CHAPTER TEN

10

Listen, there is no courage or any extra courage that I know of to find out the right thing to do. Now, it is not only necessary to do the right thing, but to do it in the right way and the only problem you have is what is the right thing to do and what is the right way to do it. That is the problem. But this economy of ours is not so simple that it obeys to the opinion of bias or the pronouncements of any particular individual.

—Dwight D. Eisenhower

Monetary Policy

Learning Objectives

After reading this chapter, you should know:

The goals of monetary policy, including sustainable economic growth in the long run; and stable prices and full employment in the short run

The policy process and various lags in it

The formulation of monetary policy and the major pitfalls of that process.

The contents and format of the policy directive

How open market operations affect the fed funds rate

The Fed's new tools in response to the 2007–2008 financial crisis

CAN THE BUSINESS CYCLE BE MITIGATED?

The Great Depression of the 1930s was by far the most severe downturn of the U.S. economy during the twentieth century. For more than a decade, output and employment remained considerably below the natural rate. Measured unemployment averaged more than 20 percent, and prices fell by more than 25 percent. During this painful period, macroeconomics underwent profound changes. Led by John Maynard Keynes, a school of thought was born that emphasized the need for government intervention to stabilize the level of economic activity.

The buildup for World War II in the early 1940s seemed to validate Keynesian theory. Almost overnight, the economy went to full employment, and measures were needed to "control" inflation. Based on such events, much of the academic community accepted Keynesian theory in the postwar period. During the 1960s, Keynesian policy prescriptions were put into practice by the government with some apparent success. Although voices of dissent were always there, they became louder during and after the 1970s when the economy was plagued concurrently by high unemployment and high inflation, a condition that came to be known as **stagflation.** Economists struggled to understand the causes of and remedies for this dilemma, which Keynes believed could not happen.

Stagflation
A condition of concurrent high unemployment and high inflation.

Since the Great Depression, the U.S. economy has experienced 11 recessions. During these periods, output declined, unemployment increased, and the growth rate of prices generally fell. The economy also has experienced periodic bouts of rapid inflation. Some analysts believe that the government has been successful in reducing the length and magnitude of cyclical downturns and in lengthening cyclical expansions. A repetition of the Great Depression has been avoided, and the expansions of the 1980s and 1990s were of record length. Following a mild recession in early 2001–2002, the U.S. economy continued to expand until December 2007 when the U.S. economy again entered a recession. This latest downturn was related to a severe crisis in the financial system that began with a crisis in the mortgage market stemming from the subprime loan debacle and the collapse of housing prices. By September 2008, what started in the mortgage markets had spread to global financial markets as credit markets froze up and the economy seemed on the verge of possibly the worst crisis since the Great Depression. Policy makers worked frantically to prop up the flailing economy. In the largest bailout in history, policy makers got a reluctant Congress to pass a $700 billion package while the Fed was taking historic actions to mitigate the crisis. The incoming Obama administration promised an even bigger stimulus package as the economy entered 2009 in the doldrums. Such stimulus policies seem to support what Keynes would have recommended and hopefully the economy will get back on track. In this chapter, we look at the macroeconomic goals of monetary policy and the challenges in formulating and implementing it. We shall see why it may not be an easy job to fix an economy in crisis as the current experience appears to be confirming.

THE GOALS OF MONETARY POLICY

Monetary policy involves the Fed's use of its policy instruments to affect the cost and availability of funds in the economy to speed up or slow down the level of economic activity. In conducting monetary policy, the Fed works through the financial system. The Fed's primary tools for influencing the financial system include control of 1) the funds available for reserves, 2) the required reserve ratio, and 3) the primary and secondary credit rates. In addition, the Fed has developed additional tools in response to the ongoing financial crisis of 2008 and 2009, which are discussed in the accompanying "A Closer Look." Monetary policy influences the borrowing, lending, spending, and saving behavior of the household, business, government, and rest-of-the-world sectors.

The specific goals of monetary policy are to design and implement policies that will achieve sustainable economic growth in the long run and full employment and stable prices in the short run. Some members of the Federal Open Market Committee (FOMC) and other analysts have stressed that maintaining stable prices is the primary goal of the Fed. Others have contended that employment levels in the economy must not be ignored, particularly in the event of an overall collapse of employment.

Now let's take a closer look at the rationales for these goals.

Sustainable Economic Growth

Real gross domestic product (GDP)
The real or inflation-adjusted quantity of final goods and services produced in an economy in a given time period.

The size of the "economic pie" divided up among a nation's citizens is determined by the quantity of goods and services produced—that is, the size is determined by real output or **real gross domestic product (GDP).** *Real GDP* is the real or inflation-adjusted quantity of final goods and services produced in an economy in a given time period, usually one year. Simply put, if the size of a nation's economic pie and, thus, its potential standard of living are to rise over time, the productive capacity of the economy must expand.

Most economists agree that the growth of potential output over time is determined primarily by the growth of capital, labor, and productivity. Thus, growth of the key inputs in the production process and technological improvements are critical to long-run growth of output. So far so good—but what determines the growth of these factors?

The growth and productivity of the capital stock depends directly on the amount of investment spending undertaken by firms. By definition, the change in the capital stock is equal to the net amount of investment spending. The productivity of capital is thought to depend on the amount of resources devoted to research and development and on the resulting technological advances that lead to new and more productive plants and machines.

In general, a thriving nation's productive capacity grows over time. Labor force growth flows from population growth and from increases in the portion of the population that participates in the labor force. The productivity of labor is thought to depend on the educational attainment and health of workers, the quantity and quality of the capital stock with which they work, and perhaps, the competitive environment faced by firms and their employees.

Beyond these fairly obvious influences, the overall economic environment within which firms and households are making decisions is also important. A stable environment where workers are fully employed is likely to be more conducive to farsighted planning and decision making that enhance an economy's long-run growth potential. On the other hand, an unstable environment characterized by a series of inflationary booms and busts is likely to inhibit long-run growth. In such a situation, economic activity almost always grows faster or slower than the economy's capacity, thereby generating either heightened inflationary pressures or economic weakness. In any case, a stable and healthy financial system is necessary for the economy to achieve its goal of sustainable economic growth.

Stabilization of Unemployment and Inflation

Discussions about the health of the economy usually focus on recent and expected movements in unemployment and inflation. Policy makers must also be concerned about unemployment, as measured by the unemployment rate, if the economy is to reach its full economic potential. Unemployment means slower economic growth because some resources are being wasted. The economy is operating below its economic potential and firms will be hesitant to invest when there is underutilization of existing resources. From an economic standpoint, output that could have been produced last year by the unemployed is lost forever and can never be made up. Our nation's leaders operate with a clear

mandate to pursue policies that encourage full employment to achieve sustainable economic growth.

What is less clear is why inflation generates so much concern. Simply stated, inflation is the rate of increase in the general price level. The consumer price index (CPI), which is discussed in the "Cracking the Code" feature on p. 106 in Chapter 5, is the most frequently cited measure of the price level in the United States. It measures the average level of prices of a typical market basket of goods and services that consumers purchase. However, the month-to-month percentage change in this index gives us a somewhat distorted measure of inflation because it fails to take into account the fact that the market basket on which the index is based will change as relative prices of the items in the index change. For example, if gas prices increase far more than other prices, consumers, where possible, will drive less and consume more of the other items whose prices have not increased as much. This substitution will not be taken into account; hence, the CPI tends to overstate inflation.

Personal Consumption Expenditures Price Index (PCEPI)
A price index measures the average change in the prices of all domestic personal consumption expenditures. The PCEPI changes the weights of items in the index as consumers substitute out of things that have become relatively more expensive and into items that have become relatively cheaper. Thus, it gives a better measure of inflation than the CPI, which does not.

Because of this, the **personal consumption expenditure price index (PCEPI)** is actually the price index that the Fed monitors more closely in the formulation of monetary policy. The PCEPI measures the average increase in the prices of all domestic personal consumption. The base year is currently the year 2000. It is different from the CPI that uses a fixed basket of goods and services where the weights for the items in the basket are not changed for several years. The PCEPI uses an indexed method that compares the composition of expenditures on a given quarter's basket of goods and services to the last quarter. Thus, the weights of items in the PCEPI change, as consumers substitute out of things that have become relatively more expensive and into items that have become relatively cheaper. Thus, as prices change, some more than others, the PCEPI more accurately captures how consumers respond to those price changes. On average, since 2000, the PECPI has risen about a third less than the CPI because of this substitution effect, which the CPI fails to capture.

Measurement aside, why do policy makers worry about inflation? After all, if the prices of all goods and services double, but so do wages and salaries, then isn't the nation as a whole unaffected? The short answer is no. To see why, it is useful to distinguish between expected inflation and unexpected inflation.

Suppose it's the year 2009 and households expect inflation to be about 3 percent in 2010. How will this expectation affect household behavior? First and foremost, the workers in the households will try to secure wage increases of at least 3 percent so that the purchasing power of their incomes will not decline. Ideally, of course, they would hope for a wage increase of more than 3 percent so that their real incomes would rise. Second, if they are net lenders, they will be looking for financial assets with nominal interest rates or nominal returns high enough to produce an adequate expected real return. For example, as discussed in Chapter 6, a nominal return of 7 percent, given expected inflation of 3 percent, is expected to produce a real return or real interest rate of about 4 percent. If inflation turns out to be close to 3 percent as expected, all is well. But what happens if prices actually rise by 5 percent?

First, the real wage of workers will fall because nominal wages will rise by a smaller percent than prices. The resulting change in output prices relative to input prices will, ceteris paribus, lead to an increase in firms' profits and encourage them to alter production and employment. That is, until expectations adjust to the unanticipated higher price level, firms will offer more for sale than what is sustainable in the long run—and vice versa if actual inflation turns out to be less than anticipated. Second, the real return on financial assets acquired will be less than anticipated and perhaps even negative. In this case, borrowers who find that the actual real cost of borrowing is well below what they expected will benefit, but lenders will lose. Beyond these types of redistribution,

The Fed's New Tool Kit

Throughout this text, we have discussed the ongoing upheaval in financial markets spawned by the crisis in the subprime lending market. The financial crisis rapidly spread to other domestic and global markets, demonstrating the interconnectedness of global financial markets. In light of the pressures on short-term markets, where a severe shortage in the supply of credit was apparent, the Fed in late 2007 and early 2008 announced a series of measures to mitigate the crisis. For the United States, these new measures include the establishment of a Temporary Auction Facility, Primary Dealer Credit Facility, and a Term Securities Lending Facility. Note that these measures came before the widespread bailouts and multiple failures of financial firms. They also predate the $700 billion bailout by Congress (the Emergency Economic Stabilization Act [EESA] discussed in Chapter 12) to promote the safety and stability of the financial system in September 2008. In addition, while the bailout was being negotiated by Congress with the help of the Treasury and the Fed, the Fed created a new lending facility, the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility that was designed to help money market mutual funds experiencing severe strains. In addition, in late 2008, the Fed created the Commercial Paper Lending Facility, the Money Market Investor Funding Facility, and the Term Asset-Backed Securities Loan Facility, all of which were designed to facilitate liquidity and new lending in troubled financial markets. These actions by the Fed are unprecedented attempts to prevent a widespread financial collapse. They also had the effect of greatly increasing the assets on the Fed's balance sheet, as they all represented loans by the Fed (assets for the Fed) or direct purchase by the Fed of financial instruments (other than Treasuries) to support the financial system. Between early 2008 and 2009, the assets of the Fed approximately doubled in size from just under $1 trillion to almost $2 trillion as a result of the special programs to address the financial crisis. What follows is a brief discussion of each of these new programs.

The Temporary Auction Facility (TAF)

Temporary Auction Facility (TAF)
A program begun in December 2007, whereby the Fed auctions funds to depository institutions for 28 or 84 days. Designed to provide liquidity to the financial system.

Through the **Temporary Auction Facility (TAF),** the Fed directly auctions funds to all depository institutions that are eligible to borrow at the discount window. The Fed announces the amounts and timings of the auctions, and bids are accepted through the local Reserve Banks. The original term of the loans was twenty-eight days. In August 2008, the Fed began auctioning both 28 and 84-day loans TAF funds. Prepayment of the loans is not allowed. Both competitive and noncompetitive bids are accepted in a single-price auction method. The interest rate on the loans is fixed at the stop-out rate as determined by the supply and demand bidding process. The bid amount of a single bidder is limited to 10 percent of the offering. The minimum bid for funds is $5 million, with additional increments of $100,000.

This facility is designed to ensure that liquidity is provided when other short-term markets such as the federal funds market are under stress. These injections of

funds into the market by the Fed supplements open market operations and discount loans. Discount loans are usually overnight loans. Whereas open market operations are limited to the 17 or so primary dealers, all depository institutions eligible to borrow at the primary credit rate through the discount window can borrow through the TAF. In addition, a broader range of collateral is accepted when funds are borrowed through the TAF than at the discount window, and there is less of a stigma from borrowing at the TAF than at the discount window. When borrowing occurs at the TAF, reserves are injected into the system. How long the program will continue depends on credit market conditions, as it has no expiration date. In early February 2009, the Fed had outstanding loans amounting to over $400 billion through this facility.

The Primary Dealer Credit Facility (PDCF)

Primary Dealer Credit Facility (PDCF)
A program begun in March 2008, whereby primary dealers can borrow overnight from the Fed at the primary credit rate. Designed to increase liquidity and to provide support for the financial system.

In March 2008, the Fed began a program called the Primary Dealer Credit Facility (PDCF), where primary dealers can borrow directly from the Fed. The new credit facility operates similarly to the way that banks borrow from the Fed at the discount window. The PDCF hopes to improve the ability of primary dealers to provide funds for participants in the mortgage-backed security meltdown due to the housing crisis. The PDCF will provide overnight funding to primary dealers in exchange for a specified range of collateral that includes all Treasury and agency securities, all investment-grade corporate securities, municipal securities, mortgage-backed securities, and some asset-backed securities. Because these are direct loans by the Fed, the amount of reserves in the system will increase by the amount of the loans. The rate charged on the overnight loans is the same as the primary credit rate charged for borrowing at the discount window. The PDCF will remain in operation for a minimum period of six months and may be extended as needed to ensure the smooth functioning of financial markets in a time of crisis. As of January 2009, the PDCF is authorized to loan to primary dealers through October 30, 2009. This is the first time that Fed lending has been extended to nonbanks. The creation of this facility resulted from the bailout of the investment banking house, Bear Stearns, and the subsequent takeover by JPMorgan. By early 2009, the credit outstanding was just over $30 billion.

The Term Securities Lending Facility (TSLF)

Term Securities Lending Facility (TSLF)
A program where the Fed auctions government securities to primary dealers for a 28-day or longer period in exchange for less liquid and less credit-worthy securities such as mortgage-backed securities. Designed to increase liquidity without increasing reserves.

Also in March 2008, the Fed created a Term Securities Lending Facility (TSLF) that would lend up to $200 billion of Treasury securities to primary dealers for a term of 28 days, as opposed to an overnight loan under the PDCF. Auctions have been held weekly since March 27, 2008, and acceptable collateral includes federal agency debt and agency mortgage-backed securities, as well as non-agency mortgage-backed securities. Although 28-day loans are currently made, the maximum term is 90 days. The minimum bid is $10 million, with $10 million increments thereafter. Note that the TSLF does not lend funds directly to primary dealers. Rather, they auction off Treasuries in exchange for less-liquid securities. The lending rate is usually between 7 and 15 basis points, which represents the price primary dealers are willing to pay for the greater liquidity. The lending fee can be thought of as approximately equivalent to the spread between the Treasuries that are borrowed and the interest rate for the less desirable

pledged collateral over the term of the loan. The purpose of this lending facility is to improve the liquidity of the primary dealers who choose to participate. Rather than holding illiquid mortgage-backed securities, primary dealers would now be holding liquid Treasuries. Because the same amounts of securities are outstanding from the Fed, there is no impact on reserves. In July 2008, the Fed authorized the auction of up to $50 billion of Treasury securities options to borrow from the TSLF. The Fed intended to use the options program before periods when it anticipates elevated stress in financial markets. The $50 billion in authorized options to borrow in TSLF is in addition to the $200 billion limit in the TSLF program. Like the PDCF, the TSLF is authorized to operate through October 30, 2009. In early February 2009, the Fed held about $120 billion of dealer securities through this program which they accepted in exchange for the more liquid Treasuries.

The Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility

Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF)
A new lending facility where commercial banks or bank holding companies could borrow from the AMLF to purchase asset-backed commercial paper from money market mutual funds. Designed to reduce the strains on money market mutual funds due to disintermediation.

On September 19, 2008, the Fed announced the creation of a new lending facility, the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF). The purpose of this facility was to assist money market mutual funds that were experiencing severe disintermediation as depositors withdrew uninsured deposits. Depository institutions and bank holding companies could now borrow from this facility at the primary credit rate and use the proceeds of the loans to purchase high quality asset-backed commercial paper from money market mutual funds. On the same day, the Treasury announced a temporary program that would extend deposit insurance to money market mutual fund deposits that paid a premium for the coverage. Note that there was no limit on the amount of coverage per account, as there is at commercial banks. The Treasury thought there was a need for such a program to stop the run on money market mutual funds that would further cripple the global financial system. By early February 2009, the Fed had lent just over $16 billion to depository institutions and bank holding companies for this purpose.

The Commercial Paper Funding Facility (CPFF)

The Commercial Paper Funding Facility (CPFF)
A special lending facility designed to support the commercial paper market through effectively purchasing outstanding commercial paper and giving greater assurance that commercial paper will be able to be rolled over when it matures.

The Commercial Paper Funding Facility (CPFF) was created to support the commercial paper market at a time when it was experiencing severe strains. The volume of outstanding commercial paper had fallen, rates on longer term paper had increased significantly, and a large amount of commercial paper had to be rolled over on an overnight basis. Investors were hesitant to purchase commercial paper, and this was further crippling financial and nonfinancial firms that relied on the issuance of commercial paper for their financing needs. The CPFF was designed to increase the funds to this market and to insure both issuers and investors in commercial paper that funds would be available to pay investors when newly issued commercial paper was maturing. In early February 2009, the Fed had purchased about $260 billion of commercial paper under this facility.

The Money Market Investor Funding Facility (MMIFF)

Money Market Investor Funding Facility (MMIFF)
A special lending facility that supports a private plan to provide liquidity to U.S. money markets by funding the purchase of short-term CDs and commercial paper from money market mutual funds and money market investors.

The Money Market Investor Funding Facility (MMIFF) supported a private plan to provide liquidity to U.S. money markets by funding the purchase of short-term CDs and commercial paper from money market mutual funds and money market investors. If money market mutual funds had a liquidity squeeze from investors who wanted to redeem shares, the fund could sell short-term CDs and commercial paper to the MMIFF in order to raise the funds to meet the redemptions. The presence of such a Fed-created funding facility helps to restore confidence for money market investors and increase their willingness to invest in money market instruments. The MMIFF complements the CPFF and the AMLF to improve liquidity and funding in short-term credit markets.

The Term Asset-Backed Securities Loan Facility (TALF)

The Term Asset-Backed Securities Loan Facility (TALF)
A special lending program to issuers of asset-backed securities that were collateralized by student loads, auto loans, credit card loans, and loans guaranteed by the Small Business Administration. The proceeds of the loans could then be used to issue new asset-backed securities.

The Term Asset-Backed Securities Loan Facility (TALF) was designed to support the asset-backed securities markets which were collateralized by student loans, auto loans, credit card loans, and loans guaranteed by the Small Business Administration. Under the program, the New York Fed will lend an amount up to $200 billion to the issuers of asset-backed securities. The asset-backed securities will serve as collateral for the Fed. The issuers can then use the proceeds of the loans to issue new asset-backed securities. Due to the financial crisis, new issuances of asset-backed securities have declined. Such issuances provide new funds to lending for consumer credit and SBA loans, which are vital to the adequate function of credit markets.

Note that the TAF, PDCF, and TSLF make loans to depository institutions and other financial institutions as part of the lender of last resort function of the Fed. All provide liquidity to sound financial institutions. A second set of programs, including the AMLF, CPFF, MMIFF, and TALF support specific financial markets such as the commercial paper and the asset-backed securities markets. In addition, the Fed has also created assets on their balance sheets to assist in the bailout of Bear Stearns and American Insurance Group (AIG). Finally, the Fed has also started directly purchasing up to $500 billion of longer-term agency securities (primarily Fannie Mae, Freddie Mac, and Federal Home Loan Bank securities) to hold in its portfolio.

citizens living on fixed incomes, including many retirees, will find their purchasing power shrinking.

These simple examples illustrate a central reason why inflation, particularly unexpected inflation, is worrisome. Inflation redistributes income in arbitrary and unpredictable ways from workers to firms, from lenders to borrowers, and from those on fixed incomes to those with variable incomes that increase with inflation.

In addition, due to several features of the U.S. tax system, many firms and households will pay proportionately more taxes to the government in an inflationary environment. To illustrate, suppose that a household earns 4 percent interest on its surplus funds, the actual and expected inflation rate is zero, and the household is in the 25 percent tax rate bracket; then the household's after-tax real return is 3 percent, as Equation (10–1) shows:

	nominal interest rate	–	expected inflation rate	–	taxes	=	real after-tax return
(10–1)	.04	–	0	–	$(.25 \times .04)$	=	.03, or 3%

Now suppose that, ceteris paribus, expected and actual inflation rises to 2 percent and the nominal interest rate rises from 4 to 6 percent to compensate lenders for the loss in purchasing power. The real after-tax return will again be the nominal rate minus the expected inflation rate and taxes. In this case, the real after-tax return equals 2.5 percent, as shown in Equation (10–2):

	nominal interest rate	–	expected inflation rate	–	taxes	=	real after-tax return
(10–2)	.06	–	.02	–	$(.25 \times .06)$	=	.025, or 2.5%

Because nominal returns rather than real returns are taxed, inflation results in government taxes taking a larger portion of interest income than in a noninflationary environment. Inflation also reduces the real value of nominal money balances held. In this way, it acts as a tax on such holdings.

Inflation can also have an adverse effect on the nation's international competitiveness and, thus, its role in the world economy and in world affairs. For example, if the prices of U.S. goods rise relative to prices of competing goods in the rest of the world, ceteris paribus, the demand for U.S. products will fall with attendant effects on domestic production and employment. Although the resulting depreciation of the dollar will help to offset and reverse the negative effects on the trade balance over time, there is no assurance that this will occur quickly. In the meantime, U.S. firms will lose a portion of their share of world markets.

Researchers have also found that as the inflation rate rises, the variability of inflation tends to increase and the relationship among relative prices tends to become more volatile and difficult to predict. Consequently, pricing, production, saving, and investment decisions have to be made in a more uncertain environment. Firms and households are likely to be much more cautious about making long-term commitments to spend, save, produce, or invest; instead, they focus on near-term opportunities. This perspective does not enhance long-run stability and growth and can aggravate short-run instabilities and cyclical fluctuations.

Deflation
A drop in the overall price level as measured by a price index.

Last, policy makers must also be on the alert for **deflation,** or a falling overall price level—something the U.S. economy has not experienced since the Great Depression. Deflation is often worse than inflation because it can lead to debt deflation, defaults, and bankruptcies. When inflation levels are very low, the potential that the economy could slip into a deflation increases. In the late 1990s and early 2000s, inflation rates fell to their lowest levels in 40 years causing some concern about the possibility of deflation. Again in 2008, as prices of commodities, stocks, and houses all fell, consumers reduced spending and deflation again became a major concern for many economists. They believe that the Fed must be more concerned about deflation than inflation because the effects are not symmetrical. As experienced during the Great Depression and more recently in the 1990s in Japan, deflation can be more deleterious to an economy than inflation, particularly if it leads to a drop in asset prices and widespread bankruptcies. Because the effects of inflation and deflation on the economy may not be symmetrical, the Fed may be even more concerned about deflation than inflation.[1]

Recap The goals of monetary policy are sustainable economic growth in the long run and full employment and stable prices in the short run. Full employment is necessary for a nation

to reach its economic potential. A stable price level is desirable because unexpected inflation redistributes income in arbitrary and unpredictable ways and can slow economic growth. Inflation can also affect the U.S. competitiveness in world markets.

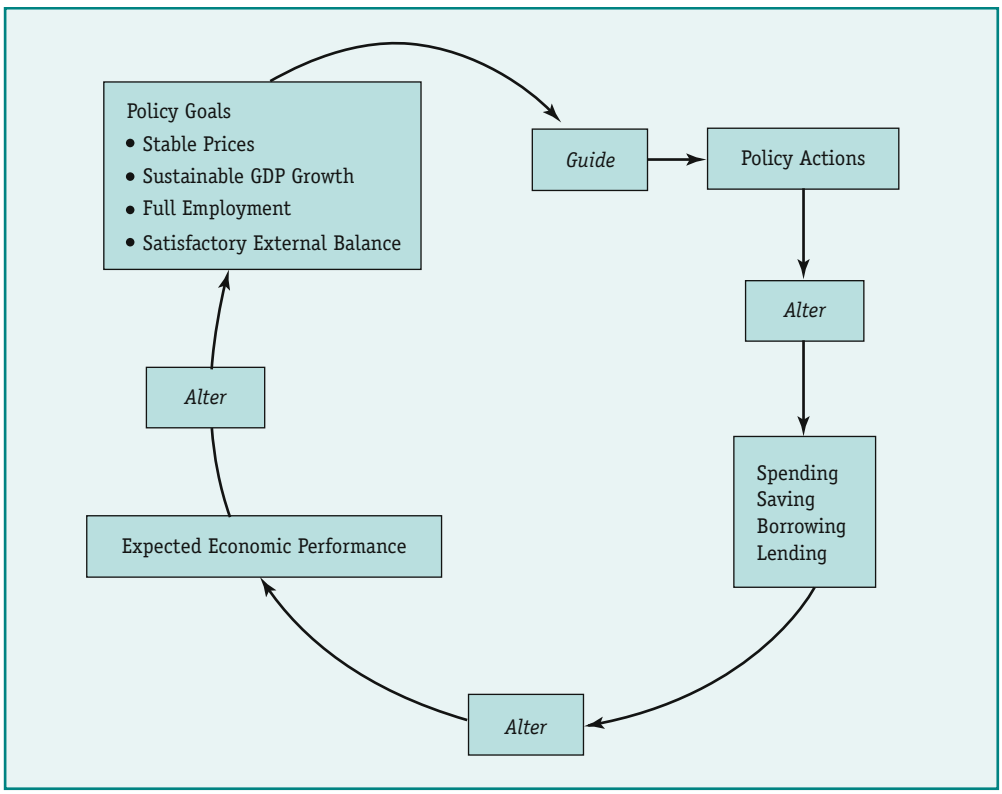
THE POLICY PROCESS

Given the goals of monetary policy, the essential elements of the policy process and the problems surrounding the conduct of monetary policy can be illustrated with the aid of Exhibit 10–1. The policy goals, combined with the expected economic performance guide policy actions, which then, in turn, alter spending, saving, borrowing, and lending decisions.

At first glance, the challenges facing policy makers do not seem that imposing. Compare the expected performance of the economy to the goals. If the economy's performance is expected to be close to the goals, leave the policy unchanged; if the economy's performance is expected to fall well short of the goals, alter the policy accordingly. The reasoning is so simple and seemingly sensible that it leads one to wonder how policy and policy makers can ever go astray. Any policy maker, however, will tell you that making policy is both difficult and frustrating, laden with a never-ending series of problems and pitfalls. Obviously, we need to reflect a bit more deeply about the process depicted in Exhibit 10–1.

To begin, let's assume policy makers have already established policy goals that they would like to see the economy achieve. The next step as depicted in Exhibit 10–1 is to determine the likely performance of the economy if policy remains unchanged. How do policy makers do this?

10-1
A Conceptual Overview of the Macroeconomic Policy Process



The basic approach is to use various statistical methods and models, judgment based on historical experience, and incoming data on the full range of factors to develop a forecast for the variables of major concern such as real gross domestic product (GDP), inflation, and the unemployment rate. The data that are used include information about retail sales, industrial production, consumer confidence, business capital spending plans, wages, personal income, and profits. If the incoming data and the forecasts suggest the economy's performance is deviating significantly from the goals and priorities, the policy makers will consider a change in policy to move the economy's likely performance closer to the goals.

Two aspects of the forecasts and incoming data used by policy makers deserve special note. First, forecasting is an imperfect science, so forecasting errors can be fairly large. The greater the volatility in economic variables, the larger the errors tend to be. Because of the possibility of significant errors, policy makers typically do not give heavy weight to forecasts in policy discussions.

Second, there is a strong tendency to focus on incoming data and to use the figures to guide policy. These figures, which define "current economic conditions," attract considerable media attention and generate much of the political pressure that periodically bears down on policy makers. For example, if the current data suggest that the economy is growing slowly, there will be considerable pressure on policy makers to stimulate the economy even though forecasts suggest that the economy will strengthen in six to nine months without further policy action.

Assessing the Economic Situation

Generally, as data reports are published, policy makers ask themselves two simple questions: Are the data consistent with our economic outlook and desires, so that no change in policy is needed? Or are the data signaling that the economy's performance has deviated so markedly from what was expected that we should consider a change in policy? In reality, the process of filtering and assessing incoming data (much of which is estimated) is somewhat more difficult than one might imagine. The problem is that many monthly data releases are quite volatile or noisy, possessing a large element of what statisticians call *irregular variance*. The irregular variance or random fluctuations in the data make the data unreliable as policy indicators. As a result of potentially large month-to-month fluctuations, it is often necessary to have data for two to three months on hand before the underlying cyclical or trend movements in an individual data series become evident.

When analysts try to generalize from individual data series (or sectors of the economy) to the economy as a whole, they often encounter another problem. The noise in the individual series may cause a collection of different series to transmit conflicting signals on the underlying strength of the economy. For example, the data reported for February might show that retail sales are stronger than expected, suggesting that the rate of consumption spending is increasing. At the same time, new orders for capital goods and housing starts are weak, suggesting that the rate of business fixed investment and residential investment spending is slowing. Here again, if the economy is in fact deviating from its expected track, it will usually take several months of data releases covering the full spectrum of the economy's performance before the ambiguities in the monthly data are resolved. In sum, policy makers need time to recognize that a change in the economy's performance has occurred. This time between a significant and unexpected change in the economy's performance and policy makers' recognition of that change is called the **recognition lag** in the policy-making process.

Recognition Lag
The time it takes policy makers to recognize that a change in the economy's performance has occurred.

From Assessment to Action

As evidence begins to accumulate that the economy is deviating significantly from the desired path, a consensus develops among policy makers that policy needs to be altered. For example, if the economy is strengthening considerably and inflationary pressures are building, there is a need to slow down the economy somewhat. At this point, the focus shifts from assessing the economy and considering whether anything needs to be done to deciding exactly what should be done. What policy tools should be used, how large or small should the policy adjustment be, and when should the policy change take place?

Resolving these questions takes time, however. The net result is that policy actions can be paralyzed for a while, and policy makers may do too little too late. In any event, the policy-making process includes a **policy lag**—the time between the point when the need for action is recognized and the point when an adjustment policy is decided upon and set in motion.

Policy Lag
The time between the point when the need for action is recognized and the point when an adjustment policy is decided on and set in motion.

From Action to Effect

When policy makers act, does the economy respond immediately? In general, the answer is no. The policy action will set in motion a series of adjustments in the economy that will gradually alter the performance of the economy relative to what it would have been in the absence of any new policy actions. To illustrate, suppose that the economy has been growing quickly with inflation accelerating, and the Fed decides to pursue a more restrictive monetary policy. To slow down the economy, the Fed takes actions that reduce the supply of funds, and interest rates rise. Will firms cut their investment spending right away? Not necessarily. If a new plant is half completed, capacity utilization in its existing plants is high, and the demand for a firm's products is expected to remain fairly strong for the foreseeable future, then the firm (and other firms like it) will continue spending on investment projects. Gradually, however, as the rise in interest rates and reduction in the availability of funds slow economic activity, sales and capacity utilization will fall, and expectations about the future will be modified. At this point, investment spending plans will be reevaluated and possibly postponed or canceled, leading to a further deceleration in economic growth.

The slowing of the economy will be associated with a downward revision in price expectations and an adjustment of wages and other input prices. Here again, historical experience suggests that this process will be gradual rather than instantaneous.

Impact Lag
The time between when an action is taken and when that action has a significant impact on economic variables.

The net result is an **impact lag** in monetary policy—that is, the time between when an action is taken and when that action has a significant impact on prices, employment, and output. How much time you ask? Available research suggests that significant effects generally begin to show up after six months to a year or more and continue accumulating for several years. However, some analysts suggest that one of the effects of the Fed's policy of increased openness in the last decade has been to shorten this lag, which is what the Fed hopes to do. Exhibit 10–2 brings together the various lags comprising the policy process. Now would be a good time to read the accompanying "A Closer Look" titled "Why the Fed Has Become More Open."

Recap Policy goals combined with expected economic performance guide policy actions. Policy makers tend to give more weight to incoming data about current economic conditions than to forecasts, which can be unreliable. The recognition lag is the time that it takes for policy makers to recognize that economic conditions have changed and that a policy change is necessary. The policy lag is the time between the recognition of the need for action and the implementation of the policy adjustment. The impact lag is the time that it takes for the policy action to have a significant impact on the economy.

Why the Fed Has Become More Open

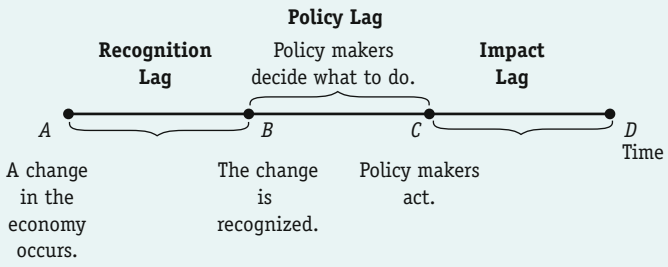
Throughout most of its history, the Fed has been a rather secretive organization surrounded by mystique. The Fed preferred to act covertly and to adjust policy gradually rather than abruptly, with the belief that such behavior minimized market disruptions and reduced the chance of a major policy error. Accordingly, the Fed did not announce policy changes immediately following FOMC meetings and the public did not find out about changes until the release of the minutes after the next FOMC meeting more than six weeks later. Thus, the Fed was using open market operations to change policy without the public's knowledge. Because open market operations are a complex blend of offsetting operations and those reflecting a change in the stance of policy, it was difficult to distinguish between the two.

All of this has changed in recent decades. As noted earlier, since 1994, the Fed has made public announcements immediately following all meetings whenever there were any changes in the fed funds rate target. In 2000, the Fed began making a statement after every FOMC meeting that included an assessment of the balance of risks to the economy. In 2002, a roll call vote was added so that the public could gauge the amount of dissent. In 2005, minutes of FOMC meetings were released with a lag of three weeks instead of six to seven weeks. Finally, in 2007, the Fed increased the number of times long-term economic projections were made from two to four times per year, and the economic projections were for three years rather than two. This openness constitutes a significant departure from the Fed's traditional behavior.

Why has the Fed abandoned its recalcitrant secretive behavior in favor of public disclosure? The reason seems to be the Fed's belief that if it better communicates current and future policy moves, there will be less uncertainty. A lower degree of uncertainty means more control over future expectations and, through this, more control over long-term rates. After all, these changes in long-term interest rates have the greatest impact on economic activity, and it is the long-term rate that the Fed is aiming to affect through changes in short-term rates.

A side effect of the new openness is that a smaller volume of open market operations is needed to hit a given targeted fed funds rate. The smaller volume results from the Fed's announcement of the new target directly and its effect on expectations of the short-term rate. The new expectations of market participants cause the rate to move in that direction before the Fed even intervenes.

A second side effect of the new openness seems to be a reduction in the long and variable lag for monetary policy to take effect in the economy. The conventional wisdom was that it took at least six months or more for an interest rate reduction to stimulate the economy. With the new openness of the Fed and the greater transparency, financial markets can more easily anticipate what the Fed will do and act accordingly and preemptively, thus reducing the lag.



The economy begins to need corrective action at point *A*, but the need is not recognized until point *B* three months later. The time that elapses between point *A* and point *B* is called the *recognition lag*. Between point *B* and point *C*, policy makers think about what actions to take and reach a decision. The time that elapses between point *B* and point *C* is called the *policy lag*. Once action has been taken at point *C*, it takes time before the economy's performance is materially affected. The distance from point *C* to point *D* represents this *impact lag*.

PITFALLS IN POLICY MAKING

Despite good intentions, policy does not always produce an economic performance that closely coincides with the nation's economic objectives. There are no simple explanations for the periodic lack of correspondence between policy makers' plans and economic performance. As in all endeavors, honest mistakes can be made, analysis can be faulty, and unexpected events beyond the policy makers' control can occur. Against this background, let's briefly examine some of the most prominent problems affecting the successful conduct of policy.

Uncertainty and Lags

Our discussion of the impact lag for policy suggests that economic developments today are largely the result of policies pursued over the past several years. Logically then, given such lags, policy makers can do little today to materially affect the current performance of the economy. What policy makers can do is affect the future performance of the economy. As we all know, however, the future cannot be known with certainty. Because economic forecasts, in particular, can be quite wide of the mark, policy makers cannot know for certain what, if anything, should be done today to improve the economy's future performance. To complicate matters further, the large month-to-month fluctuations in economic data that we discussed earlier prevent policy makers from knowing with certainty how the economy is currently performing.

The net result is that policy makers are generally quite cautious in adjusting policy. Unless there is a crisis, they prefer to move gradually rather than precipitously in the general direction suggested by the current data on the economy and the policy objectives. As understandable and reasonable as this approach sounds, some potentially serious pitfalls are lurking here.

To illustrate, imagine that you are in a shower (home, hotel, or dorm) adjusting the hot water faucet to attain the desired overall temperature of the water. The problem, especially in an older building without a modern plumbing system, is that there is often a lag between when you turn the hot water faucet and when the water becomes

warmer. Moreover, the lag can vary, depending on how many other showers have been taken in the recent past, how many are currently being taken, and how much hot water is left in the tank. In other words, you lack the knowledge you need to fine-tune the hot water. When nothing happens after several gradual adjustments, you grow increasingly impatient and keep turning the knob. At some point, a rush of scalding water bursts out and burns you. You never intended to get burned, but it happened anyway.

Policy makers have the same problem. They don't really intend, for example, to raise the inflation rate (and get burned), but it happens. The economy is performing sluggishly and policy makers want to increase economic growth. They take actions to stimulate the economy (turn up the heat), but nothing seems to happen. They—and the nation—become increasingly impatient and undertake further demand-increasing policy actions. Eventually, economic growth spurts ahead at an excessive pace, causing an unintended acceleration of inflation. Hopefully, increased knowledge will enable economic policy makers to take more precise actions, just as a modern plumbing system allows you to adjust the water temperature precisely.

In sum, the existence of lags in an uncertain world complicates policy makers' efforts to act appropriately in a timely fashion, regardless of whether contractionary or inflationary forces are building in the economy. More specifically, acting or failing to act today may aggravate inflation and cyclical fluctuations later. The economy may be destabilized rather than stabilized. In the case of recession, the push to do something now to improve the current situation as soon as possible interacts with the difficulties associated with lags and uncertainty and may lead to higher inflation later. In the case of inflationary pressures, the pressure not to do something now may, as they say, let the horse out of the barn. When there is pressure "to do something now" or "not to do something now," consistent formulation and implementation of policies conducive to economic growth and stability become even more problematic.

Data Revisions and Policy Regret

Some economic data series such as exchange rates, stock prices, and nominal interest rates are directly observable and not subject to revision. Other data, such as those on employment and unemployment, nominal and real GDP, and inflation rates, are based on sample estimates that may be subject to numerous revisions as more accurate information becomes available. We have already noted that such incoming data are subject to a great deal of white noise or random fluctuation. Policy decisions are based on incoming data that are available when the decisions are made. Data used in policy actions, such as those on output or overall prices levels, are often subject to numerous revisions. **Policy regret** occurs if revised data estimates suggest that some other course of action should have and would have been taken if the revised data had been available. For example, the Fed generally considers how far actual output is from potential output and how far actual inflation is from the inflation rate associated with stable prices. If actual output and inflation are subject to revisions, policy makers may experience policy regret. Indeed, each additional revision may imply a different optimal policy strategy.

Policy Regret
A situation in which policy actions based on available data would not have been taken if more accurate data revisions had been available.

When revised data are used to evaluate past policy decisions, policy actions often appear to be overly accommodative or overly restrictive. In evaluating policy decisions, one must consider the data that were available when the decisions were made. If the data available at the time are used, policy decisions may seem more understandable. Because the Fed is aware of data revisions and the possibility of policy regret, the impetus would be to be more cautious in changing policy. Gradual change of policy reduces the effect of data uncertainty on policy recommendations. All policy actions are based on uncertain data and those that will be revised. However, some data are more uncertain than

others. Some analysts suggest that the Fed could base policy actions on data that are less responsive to highly uncertain information or the Fed could respond to data that have been averaged over several time periods. Nevertheless, we hope that you can see how policy actions involve a great deal of skill and luck.

Globalization: A Financially and Economically Integrated World Economy

A new reality is having a profound influence on the conduct and effectiveness of domestic policies. Simply put, the economies of the world are becoming more interdependent. What goes on in Tokyo, London, Hong Kong, Paris, and Frankfurt has an increasingly important effect on economic and financial conditions in the United States. Consequently, U.S. policy makers have somewhat less control over the performance of the U.S. economy than in previous eras, when the U.S. economy was more isolated from international trade and finance. As a result, the Fed has reached out to other central banks on an informal basis to coordinate monetary policy on numerous occasions. For example, in September 2001, the central banks of Canada, England, and the European Monetary Union engaged in a coordinated interest rate cut along with the Fed shortly after the attacks on the World Trade Center and the Pentagon. In December 2007, the Bank of Canada, the Bank of England, The European Central Bank, the Swiss National Bank, and the Fed announced coordinated measures to provide liquidity to short-term lending markets in response to the crisis in the mortgage markets. Again in September 2008, the same banks along with the Bank of Japan announced coordinated actions to provide liquidity to global financial markets. Later in the same month, the Fed announced further coordinated activities with the Reserve Bank of Australia, the National Bank of Denmark, the Bank of Norway, and the Bank of Sweden.

Such interdependencies have given rise to calls for increased cooperation and coordination among world policy makers. Although the difficulties some countries have in coordinating their domestic monetary and fiscal policies suggest that coordinating policies across countries will never be easy, the existence of globalization does highlight the new challenges and complexities facing policy makers. More on this in Chapter 26.

Policy makers are attempting to meet the challenges of globalization through informal discussions among the major industrialized countries and through international organizations such as the International Monetary Fund and the Bank for International Settlements. These dialogues suggest that to achieve a stable international financial system, countries around the world must have healthy financial systems with noninflationary policies. In addition, countries must standardize the reporting of information about financial markets, institutions, laws, regulations, international reserves, external debt (both short- and long-term), and the health of the banking sector. Finally, the surveillance of international organizations that oversee the international financial system must be more transparent and open. In such an environment, the full benefits of globalization could be reached while minimizing the costs. For now, we turn to the specifics of how monetary policy is formulated.

Recap The existence of lags in an uncertain world complicates policy makers' efforts to act appropriately in a timely fashion. In a recession, the push to do something now to improve the current situation as soon as possible interacts with the difficulties associated with lags and uncertainty and may lead to higher inflation later. Data revisions may result in policy regret. In the face of inflation, the pressure not to do something now may cause further instability later. Increased globalization suggests the need for increased global coordination of monetary policy.

FEDERAL OPEN MARKET COMMITTEE DECISIONS

Economic Projections
Goals for real GDP, unemployment, and inflation over the next three years, set by the Fed four times each year.

Beginning in 1979, the FOMC published long-term **economic projections** (goals) twice a year for economic growth, unemployment, and inflation. The projections were made at the two-day meetings of the FOMC in January and June of each year and published in the semiannual *Monetary Policy Report to Congress.* In November 2007, the FOMC announced that it would begin establishing the long-term economic projections four times per year. Also, the projections would be established for the next three years rather than two. The reason for this change, as noted earlier, follows the trend since the mid-1990s of increased openness by the Fed in an effort to more clearly communicate its take on the economy and to help the public understand the basis for changes in monetary policy. The projection for economic growth would be based on projected changes in real GDP and the projection for changes in nominal GDP would be discontinued.

Core PCEPI
The PCEPI excluding the prices of energy and food, which are less amenable to control by the Fed.

The FOMC currently uses the personal consumption expenditures price index (PCEPI) and the **core PCEPI** to develop projections for inflation. As noted earlier, the PCEPI gives a more accurate measure of inflation than the consumer price index (CPI) because the basket of consumer goods on which it is based changes each year to more accurately measure the items that consumers purchased that year. The core PCEPI excludes the prices of energy and food, which are historically more volatile and less under the control of the Fed. The projections are for the current year and the following two years. The major factors influencing the long-term policy decisions at any point in time include: (1) recent and prospective inflationary pressures, (2) the current and prospective pace of economic expansion, especially with reference to the economy's growth

10-3
Economic Projections of Federal Reserve Governors and Reserve Bank Presidents for 2008, 2009, and 2010

2008 Indicator	Range Percent	Central Tendency* Percent
Growth of Real GDP[b]	0.9 to 1.8	1.0 to 1.6
PCE prices (inflation)	3.4 to 4.6	3.8 to 4.2
Core PCE inflation	2.0 to 2.5	2.2 to 2.4
Unemployment	5.5 to 5.8	5.5 to 5.7
2009 **Indicator**	**Range Percent**	**Central Tendency***
Growth of Real GDP[b]	1.9 to 3.0	2.0 to 2.8
PCE prices	1.7 to 3.0	2.0 to 2.3
Core PCE inflation	1.8 to 2.3	2.0 to 2.2
Unemployment	5.2 to 6.1	5.3 to 5.8
2010 **Indicator**	**Range Percent**	**Central Tendency***
Growth of Real GDP[b]	2.0 to 3.5	2.5 to 3.0
PCE prices	1.6 to 2.1	1.8 to 2.0
Core PCE inflation	1.5 to 2.0	1.8 to 2.0
Unemployment	5.0 to 5.8	5.0 to 5.6

[a] The range for a variable in a given year includes all of the projections by the Fed governors and Reserve Bank presidents. The central tendency excludes the three highest and three lowest projections for each variable.
[b] Change from average for fourth quarter of previous year to average for fourth quarter of year indicated.
Source: Monetary Policy Report to the Congress (July 15, 2008). Available online at **http://www.federalreserve.gov/BoardDocs/HH/2008/July/fullreport.htm.**

Monetary Rules Versus Discretionary Risk Management

Monetary policy could be implemented following a prescribed rule such as targeting a given inflation rate, a given money supply growth rate, a certain interest rate, or some other criteria. Regardless of how the economy functions, the central bank would follow the prescribed rule, which would be set by some governmental authority. On the other hand, the central bank could be autonomous and maintain a great deal of discretion in the formulation of policy.

In recent years, the Fed has been chaired by a strong leader who has aspired to an "eclectic" approach to monetary policy with a great deal of discretion. This discretion has focused on risk management where the risks range from "well-defined to the truly unknown."[a] Hence, the full range of outcomes and their probabilities are not known. Accordingly, monetary policy involves a great deal of judgment in evaluating the different risks and their probabilities. Consequently, discretion is a mainstay in policy formulation.

Some analysts have always questioned, however, the amount of freedom a central bank should have in deciding monetary policy. The controversy can be summarized this way: should the Fed be tied to a simple policy rule, or should it have a great deal of discretion in deciding policy actions?

Perhaps the best-known advocate for rules is Nobel laureate Milton Friedman, who suggested that the money supply should grow at a steady, publicly stated rate. The growth rate in the money supply over the long run would compensate for the growth in output and, therefore, stabilize the price level. This would reduce the uncertainty about what the Fed was up to. Advocates of such a rule argue that the effectiveness of discretionary policy is limited by data measurement errors, unknown and variable lags, changing relationships among variables, and political pressures to ease policy. Thus, to stabilize the economy, the best the Fed can do is adopt a rule and stick with it, thus removing the uncertainty surrounding what the Fed does.

In recent decades, others have pointed out that there is a time inconsistency problem in monetary policy. For example, a time inconsistency problem exists if you eat dessert today but intend to diet tomorrow but when tomorrow comes, you decide not to diet. Another example is smoking, where pleasure is in the present. In both examples, the cost of the action (or inaction) includes health problems, shortened lifespan, and so on, which are in the future. In monetary policy, an example of a time inconsistency problem is the benevolent Fed's stimulation of the economy today in a recession while anticipating that it will slow the economy tomorrow to prevent an inflationary boom. When tomorrow comes, what seemed optimal before now appears less than optimal, and policy ends up having an inflationary bias. Furthermore, without a rule, market participants are always guessing what the Fed's next move will be, increasing uncertainty and instability, which is the opposite of what the Fed is supposed to do.

On the other hand, a strong case for discretion was perhaps best made by Chairman Alan Greenspan:

> Uncertainty is not just an important feature of the monetary policy landscape: it is the defining characteristic of that landscape. As a consequence, the conduct of

monetary policy in the United States at its core involves crucial elements of risk management, a process that requires an understanding of the many sources of risk and uncertainty that policymakers face and the quantifying of those risks when possible. It also entails devising, in light of those risks, a strategy for policy directed at maximizing the probabilities of achieving over time our goal of price stability and the maximum sustainable economic growth that we associate with it. . . .

In implementing a risk-management approach to policy, we must confront the fact that only a limited number of risks can be quantified with any confidence. . . . As a result, risk management often involves significant judgment on the part of policymakers, as we evaluate the risks of different events and the probability that our actions will alter those risks. For such judgment, we policymakers, rather than relying solely on the specific linkages expressed in our formal models, have tended to draw from broader, though less mathematically precise, hypotheses of how the world works.

Some critics have argued that such an approach to policy is too undisciplined—judgmental, seemingly discretionary, and difficult to explain. The Federal Reserve should, some conclude, attempt to be more formal in its operations by tying its actions solely to the prescriptions of formal policy rules. That any approach along these lines would lead to an improvement in economic performance, however, is highly doubtful. Our problem is not the complexity of our models but the far greater complexity of a world economy whose underlying linkages appear to be in a continual state of flux. Rules by their nature are simple, and when significant and shifting uncertainties exist in the economic environment, they cannot substitute for risk-management paradigms, which are far better suited to policymaking. Were we to introduce an interest rate rule, how would we judge the meaning of a rule that posits a rate far above or below the current rate? Should policymakers adjust the current rate to that suggested by the rule? Should we conclude that this deviation is normal variance and disregard the signal? Or should we assume that the parameters of the rule are misspecified and adjust them to fit the current rate? Given errors in our underlying data, coupled with normal variance, we might not know the correct course of action for a considerable time. Partly for these reasons, the prescriptions of formal interest rate rules are best viewed only as helpful adjuncts to policy, as indeed many proponents of policy rules have suggested. In summary, then, monetary policy based on risk management appears to be the most useful regime by which to conduct policy. The increasingly intricate economic and financial linkages in our global economy, in my judgment, compel such a conclusion.[b]

Perhaps the best solution would be something in the middle such as limited discretion but with an absolute inflation cap. Under such a rule, the Fed would have unlimited discretion as long as inflation or monetary growth is kept below a certain level. If it goes above this level, the Fed would have to follow the monetary rule of maximum inflation. In reality, as noted in Chapter 9, the Fed is probably constrained by what is politically acceptable. Recall that what Congress has created, Congress can "uncreate," and if the Fed adopted a policy that was politically unacceptable, such as double-digit inflation, Congress could be quick to act. A popular suggestion and one followed by the Bank of England would be to announce an inflation target and implement policy so as to hit that target. With the Bank of England today operating via an explicit inflation target, policy makers' discretion is limited. Not so for the Fed.

Endnotes

a. "Risk and Uncertainty in Monetary Policy," remarks by Chairman Alan Greenspan at the Meeting of the American Economic Association, San Diego, California, January 3, 2004. Available on the Internet at **http://www.federalreserve.gov/boarddocs/speeches/2004/20040103/default.htm.**

b. "Monetary Policy Under Uncertainty," remarks by Chairman Alan Greenspan at a symposium sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming, August 29, 2003. Available on the Internet at **http://www.federalreserve.gov/boarddocs/speeches/2003/20030829/default.htm**.

potential and degree of capacity utilization, and (3) recent and prospective movements in the unemployment rate.

Exhibit 10–3 shows the projections presented to Congress in July 2008.

Once the long-term policy stance is set, the focus of the FOMC shifts to the immediate period. At the four other FOMC meetings over the course of the year (in addition to the meetings where the long-term projections are established), the long-term goals are reviewed and may be revised, but emphasis is on the short-term strategies.

Given its assessment of current economic conditions and the economic outlook, the FOMC comes up with short-term (usually quarterly) policy goals consistent with its longer-range goals. The major factors influencing the selection of the short-term specifications are current economic and financial conditions such as recent data on inflation, real growth, and prevailing expectations, including those about policy.

At most meetings, the policy discussions of short-term strategies center on the fed funds rate itself, as well as other interest rates. As noted previously, interest rates have gained center stage since the mid-1990s and the fed funds rate is specifically targeted in the implementation of policy. In the late 1990s and first decade of the 2000s, policy has been somewhat eclectic, and "the process of probing a variety of data to ascertain underlying economic and financial conditions has become even more essential to formulating sound monetary policy."[2] As a result, the Fed looks at many indicators to determine what it believes to be the optimum fed funds target rate.

Despite the independence, strong leadership, and eclectic nature of the Fed, an old controversy of how much discretion the Fed should have continually resurfaces at various times, sometimes more strongly than others. Now would be a good time to read "A Closer Look" on rules versus discretion, which weighs in on the controversy.

Against this background, the FOMC issues a policy directive to the Trading Desk of the New York Fed that guides the conduct of open market operations until the next FOMC meeting approximately six weeks later. The policy directive states a specific fed funds rate that the New York Fed is to target.

Recap The Fed sets long-term growth ranges for real GDP and prices. The long-term policy goals reflect recent and prospective inflationary and unemployment outlooks. Given the long-range goals, the short-term specifications are set that guide monetary policy between FOMC meetings. The Fed currently targets the fed funds rate to implement policy.

Policy Directive
A statement issued by the FOMC to the Trading Desk of the New York Fed that directs monetary policy until the next FOMC meeting; in recent years, the policy directive has targeted a specific fed funds rate.

THE FOMC POLICY DIRECTIVE AND FED COMMUNICATION

The FOMC issues a **policy directive** to the Trading Desk of the New York Fed that guides the conduct of open market operations until the next FOMC meeting approximately six weeks later. The directive, which is accompanied by a statement, is the link

between the decisions formulating policy and the actions implementing policy. The policy directive and accompanying statement for the March 18, 2008, meeting of the FOMC is reproduced here.

"The Federal Open Market Committee seeks monetary and financial conditions that will foster price stability and promote sustainable growth in output. To further its long-run objectives, the Committee in the immediate future seeks conditions in reserve markets consistent with reducing the federal funds rate to an average of around 2 ¼ percent."

The vote encompassed approval of the following statement:

> The Federal Open Market Committee decided today to lower its target for the federal funds rate 75 basis points to 2 ¼ percent.
>
> Recent information indicates that the outlook for economic activity has weakened further. Growth in consumer spending has slowed and labor markets have softened. Financial markets remain under considerable stress, and the tightening of credit conditions and the deepening of the housing contraction are likely to weigh on economic growth over the next few quarters.
>
> Inflation has been elevated, and some indicators of inflation expectations have risen. The Committee expects inflation to moderate in coming quarters, reflecting a projected leveling-out of energy and other commodity prices and an easing of pressures on resource utilization. Still, uncertainty about the inflation outlook has increased. It will be necessary to continue to monitor inflation developments carefully.
>
> Today's policy action, combined with those taken earlier, including measures to foster market liquidity, should help to promote moderate growth over time and to mitigate the risks to economic activity. However, downside risks to growth remain. The Committee will act in a timely manner as needed to promote sustainable economic growth and price stability.
>
> **Votes for this action:** Messrs. Bernanke, Geithner, Kohn, Kroszner, and Mishkin, Ms. Pianalto, Messrs. Stern and Warsh.
>
> **Votes against this action:** Messrs. Fisher and Plosser.[3]

The policy directive, along with the statement, is released to the public to communicate the FOMC's assessment of the risks to satisfactory economic performance in the foreseeable future. Note that each statement contains an evaluation of the risks with regard to sustainable economic growth and inflationary expectations (price stability). On March 18, 2008, the committee was very concerned about the weakened economic condition and less concerned about inflation.

Given the Fed's long history, the preceding releases of information to the public are a relatively recent phenomenon. In February 1995, the Fed formally adopted the practice begun in 1994 of announcing any changes in the targeted fed funds rate immediately following the FOMC meetings. By doing so, it eliminated questions and doubts about changes in policy. The announcements in 1994 occurred after a relatively long period of stable low interest rates. In these circumstances, a sudden shift to higher interest rates could have caught many market participants off guard and caused them to sustain real losses in the value of their portfolios. (Remember the inverse relationship between the interest rate and bond prices.) Thus, by announcing the increases, the Fed seems to have been attempting to give market participants a heads-up warning.

In December 1998, the FOMC also decided to announce any shift in its view of forthcoming developments in the economy. The shifts in perspective were communicated

Looking Back

The Fed's Response to the Terrorist Attacks of September 11, 2001: America's Darkest Hour May Have Been the Fed's Finest

The terrorist attacks on the World Trade Center and the Pentagon on September 11, 2001, caused unfathomable despair and unparalleled loss of life and property. The attacks struck at the core of the U.S. financial system, destroying a part of the financial infrastructure, killing employees of major financial firms, and closing U.S. financial markets for one week. Communication networks were disrupted and backup systems in payment mechanisms were activated. Market participants had to conduct business from locations outside the nation's preeminent financial center. Uncertainties about payment flows disrupted the market for bank reserves. Depository institutions with excess reserves were not able to borrow through traditional venues. The result was a massive mushrooming of the effective demand for reserves. Float also increased considerably as air traffic came to a halt.

The Fed's first response to the attacks was to announce that it would supply all liquidity needed as a result of the disruption. The announcement was immediately followed by action. Increases in discount loans and open market operations supplied unprecedented liquidity to the financial system. Discount loans soared from around $200 million on September 11 to a record level of more than $45 billion on September 12. Reserve balances at Federal Reserve Banks jumped to more than $100 billion on September 12—an amount more than 10 times the normal level. Later in the week, open market operations were used to inject reserves as the record discount loans were repaid. Repurchase agreements (injecting reserves) peaked at $81 billion on September 14. The result of the Fed's swift action was a minimization of the fallout to the financial system from the attack and the avoidance of a financial crisis. By the end of September, reserve balances returned more or less to their pre-September 11 levels.

In addition, the Fed made an intermeeting change in the fed funds rate on the morning of September 17, shortly before the reopening of U.S. stock markets. It announced a corresponding decrease in the discount rate, as well. The Fed coordinated the decrease in interest rates with other central banks, including the European Central Bank and those in Canada, England, and Sweden. The Fed also arranged currency swap agreements with the European Central Bank, the Bank of England, and the Bank of Canada. The currency swaps, which totaled $68 billion, aided foreign banks in the respective countries whose U.S. operations were disrupted by the terrorist attack.

Prior to the attack, the fed funds and discount rates had been lowered a full three percentage points in a series of seven cuts since the beginning of 2001. This was the most aggressive easing in 20 years. After the attack, the Fed followed with three more cuts in addition to the one on September 17.

What were the results of such dramatic actions? The Fed's swift action caused payment mechanisms to return to normal within a few short weeks. As a result, the U.S. financial system demonstrated profound resilience in response to the horrific events. By the first quarter of 2002, the economy had turned the corner, and moderate growth was returning much sooner than many analysts had expected. Many factors

such as expansionary fiscal policy, continuing strength in consumer demand, automobile rebates, and declining inventories prompted the upturn. However, the Fed's lowering of interest rates also played a role in fostering the economic recovery. Looking back, few will say that the Fed was slow to respond to the crisis! Indeed, one of the saddest hours in U.S. history may be remembered as one of the Fed's finest.

in a statement about the likelihood of future increases or decreases in the fed funds rate. In an effort to achieve more openness, the Fed again modified its disclosure procedure in early 2000 to the format that is currently used. In addition, an individual roll call of FOMC members' votes was added instead of just the outcome of the voting being reported. These moves have reduced the uncertainty and guesswork about Fed policy and its direction at the time of the FOMC meetings. So far, since the votes have been announced, the vast majority of times they have been unanimous or near unanimous; on those few occasions when they were not unanimous, there were at most two dissenters, but more often only one.

New monthly data on economic growth and inflation indicators—the unemployment rate, retail sales, industrial production, and the consumer and producer price indexes—are also released during the intermeeting period. The Fed, under the chair's leadership, can make an intermeeting adjustment. In the last decade, intermeeting changes occurred twice in early 2001, in response to a weak economy; once in September 2001, in response to the terrorist attacks on the World Trade Center and the Pentagon; twice in August 2007, in response to the housing crisis; and twice in January 2008, in response to the further deepening of the housing crisis and once in October 2008 in response to the financial collapse. However, historically, intermeeting changes have been rare. Now would be a good time to read the accompanying "Looking Back" sidebar on the Fed's response to 9/11.

HOW THE NEW YORK FED IMPLEMENTS THE POLICY DIRECTIVE

To implement the policy directive, the Trading Desk of the New York Fed uses open market operations—the buying and selling of government securities—to manage reserve levels of depository institutions so that the fed funds rate will be equal to the targeted rate. But how does this come about?

Suppose the directive calls for "maintaining the federal funds rate at an average of around 3 percent." Immediately after the FOMC meeting, the Trading Desk derives the **reserve need,** which is the difference, if any, between actual reserves and those projected to be needed to keep the fed funds rate at the desired level. The reserve need must be met with open market operations in order to fulfill the policy directive. If the Trading Desk supplies more than the reserve need, the fed funds rate will fall. If the Trading Desk supplies less than the reserve need, the fed funds rate will rise. Note that the reserve need may be negative because reserves may need to be withdrawn by open market sales to meet the directive.

Reserve Need
The projected amount of reserves to be supplied or withdrawn by open market operations to reach or keep the fed funds rate prescribed by the policy directive.

Operationally, the manager of the Trading Desk begins the initial period following the FOMC meeting with the understanding that he needs to supply the reserve need on average over the weeks until the next FOMC meeting by conducting open market operations designed to carry out the policy directive. In practice, the manager must also consider other factors that affect reserves. The overwhelming majority of open market

Looking Forward

Will the Fed Have More or Less Power to Affect the Economy in the Future?

In the 1990s, Japan and Mexico, among other nations, struggled to fight the ravages of deflation. The banking systems in both countries experienced near collapse because of falling asset prices. As prices fell, banks owed more to depositors than the value of their assets. Loans to buy property or stocks became worthless as the land and stock prices fell and borrowers defaulted. The monetary authorities seemed to have only limited ability to counter the breakdown of the economy as banks became unwilling to make new loans. In Japan, reluctant taxpayers were forced to inject funds into the insolvent system. In Mexico, the government, which had privatized the banking system in the early 1990s, was forced to adopt a costly loan purchase program to aid the ailing banks.

The United States did not experience a collapse in the 1990s, but if it had, the Fed, with its current powers, would have had less ability to affect the economy than in the past. The Fed and other central banks have seen a decline in their ability to control their domestic economies for the following reasons:

1. The banking system's share of intermediation is declining, and it is through the banking system that the Fed currently exerts its control.
2. Control over banks by the Fed is less stringent than in the past, as banks find new ways to attract deposits that are not subject to reserve requirements.
3. Global forces are more important than ever before.

As a *Wall Street Journal* article puts it:

> An even more pervasive myth is that central bankers have enormous powers to foster economic growth. Paul Volcker [chair of the Fed, 1979–1987] was wryly amused at magazine articles calling him the most powerful man on earth. He knew that global market forces were far more powerful than the Fed. But at least he had stronger controls in the early 1980s over the money supply than the Fed has today.[a]

But this may change in the future. Note that a Proposal to Overhaul the Financial Regulatory Structure, which we will discuss in Chapter 17, would expand the Fed's power over nonbank intermediaries and any financial institution whose acts could pose a threat to the financial stability of the United States. Perhaps this is in response to the Fed's decline in power and the need for a super agency that would have the power to address threats to the entire financial system. Furthermore, the Treasury and Fed's response to the financial crisis of 2008 has undoubtedly left the Fed with more power and we suspect that this will even increase in the years to come.

Endnotes

a. George Melloan, "Don't Bank on the Fed to Ease Future Shocks," *The Wall Street Journal* (November 27, 1995): A17.

operations are designed to offset unexpected swings in the supply of reserves caused by a variety of "other factors." If not offset, these variations in reserves would induce an undesired change in the fed funds rate. The other factors that can affect reserves include changes on the Fed's balance sheet in such items as the float, Treasury deposits, gold, currency holdings, and international reserves.

As the weeks between FOMC meetings pass, various pieces of information accumulate. Each day, the Fed updates its estimates of the supply of reserves, given the previous day's change, if any, in the Fed's portfolio and new information on the other factors affecting reserves. Using updated information, the manager revises his estimate of the reserves that need to be supplied or absorbed to maintain the desired reserve conditions that coincide with the targeted fed funds rate. Thus, in response to the incoming data, the reserve need may be revised. Finally, new data about the economy may also lead to changes in the stance of monetary policy, which will also change the reserve need.

To summarize, if the fed funds rate rises above the targeted rate, the Trading Desk increases the amount of reserves available to depository institutions in order to bring the fed funds rate back to the targeted level. Likewise, if the fed funds rate falls below the targeted rate, the Trading Desk decreases the amount of reserves.

Recap

At each FOMC meeting, a policy directive is sent to the New York Fed that directs the stance of monetary policy. In recent years, the Fed has targeted the fed funds rate. The New York Fed implements the policy directive by using open market operations. In addition to the policy directive, the FOMC issues a statement to the public stating the committee's expectation for the foreseeable future regarding the goals of price stability and sustainable economic growth. The Trading Desk calculates the reserve need to fulfill the policy directive. The reserve need is based on the discrepancy between actual reserves and projections of the amount that will be needed to fulfill the policy directive. The reserve need must be met with open market purchases or sales.

This completes our section on the Fed and monetary policy. In the next sections, we look at the financial markets and financial institutions that are so profoundly affected by monetary policy. We begin with the money markets. However, before moving on, now would be a good time to read "Looking Forward," which discusses whether the Fed will have more or less power in the future.

Summary of Major Points

1. The goals of monetary policy include seeking long-term sustainable economic growth. By achieving full employment and stable prices in the short run, it is believed that long-term sustainable growth will also be achieved.
2. Full employment is a goal because if a nation is to reach its full economic potential, individuals must have an opportunity to become productive members of society. Price stability is a goal because inflation tends to redistribute income in arbitrary and unpredictable ways, especially if the change is unexpected. Inflation also contributes to uncertainty and distortions in decision making. It can have an adverse effect on the nation's international competitiveness. When inflation rates are low, policy makers must also be on the lookout for deflation. Deflation is undesirable because it can cause a debt deflation, defaults, and bankruptcies.

3. In general, a comparison between the expected performance of the economy and the economic goals guides policy actions. If the economy's performance is expected to deviate markedly from the goals, policy will be altered. Given the relatively large size of forecasting errors, policy makers tend to focus on incoming data and current conditions in considering policy adjustments.
4. The policy process involves three lags: the recognition lag, the policy lag, and the impact lag. The recognition lag is the length of time it takes for policy makers to recognize that an unexpected and significant change in the economy's performance has occurred. The policy lag is the time between the point when the need for action is recognized and when an adjustment policy is decided on and set in motion. The impact lag is the time between when an action is taken and when that action has a significant effect on prices, output, and employment.
5. The existence of lags in an uncertain world makes it difficult for policy makers to act appropriately in a timely fashion. Their actions today may increase price and cyclical fluctuations later, so they tend to be quite cautious in adjusting policy. Policy regret occurs when policy actions would not have been taken if data revisions had been available when the decisions were made. Policy regret can never be eliminated but can be reduced by basing policy actions on data that are less likely to be significantly revised or that are revised over several time periods.
6. The growing interdependence among the world's economies implies that U.S. policy makers have somewhat less control over the performance of the U.S. economy than previously, a factor that adds to the challenges and complexities facing policy makers.
7. The FOMC develops long-term economic projections for real GDP and prices four times a year for the next three years. The PCEPI and core PCEPI are used to develop the projections for inflation. Given the FOMC's assessment of current economic conditions, it comes up with quarterly policy goals consistent with its longer range goals. The major factors influencing the long-term policy decisions at any point in time include: (1) recent and prospective inflationary pressures, (2) the current and prospective pace of economic expansion, especially with reference to the economy's growth potential and degree of capacity utilization, and (3) recent and prospective movements in the unemployment rate.
8. The major factors influencing the selection of the short-term specifications are current economic and financial conditions such as recent data on inflation, real growth, and prevailing expectations, including those about policy.
9. The FOMC issues a directive to the Trading Desk of the New York Fed that guides the conduct of monetary policy until the next FOMC meeting. In recent years, the policy directive has targeted a specific fed funds rate. Since 1994, the Fed has announced policy changes immediately following FOMC meetings. In addition to the policy directive, the FOMC issues a statement to the public stating the committee's expectation for the foreseeable future regarding the goals of price stability and sustainable economic growth. The New York Fed implements the policy directive by using open market operations.
10. The Trading Desk calculates the reserve need to fulfill the policy directive. The reserve need is based on the discrepancy between actual reserves and projections of the amount that will be needed to fulfill the policy directive. The reserve need must be met with open market purchases or sales.

Key Terms

Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF), p. **XXX**
Commercial Paper Funding Facility, p. **XXX**
Core PCEPI, p. **224**
Deflation, p. **217**
Economic Projections, p. **224**
Impact Lag, p. **221**
Money Market Investor Funding Facility (MMIFF), p. **XXX**
Personal Consumption Expenditures Price Index (PCEPI), p. **215**
Policy Directive, p. **228**
Policy Lag, p. **219**
Policy Regret, p. **223**

Primary Dealer Credit Facility (PDCF), p. **212**
Real GDP, p. **214**
Recognition Lag, p. **219**
Reserve Need, p. **231**
Stagflation, p. **210**
Temporary Auction Facility (TAF). p. **211**
Term Securities Lending Facility (TSLF), p. **213**
Term Asset-Backed Securities Loan Facility (TALF), p. **XXX**

Review Questions

1. What are the goals of monetary policy? How are the goals of full employment and stable prices related to the long-run goal of economic growth?
2. How can policy makers affect long-run growth?
3. What is deflation, and why do policy makers have to be concerned about it?
4. What is the recognition lag? The policy lag? The impact lag?
5. Are current incoming economic data or forecasts more important in guiding monetary policy? Why?
6. When is it most difficult to interpret incoming data? (*Hint:* Consider the case in which retail sales are weak but new orders for capital goods are strong, etc.)
7. What is *policy regret?* What are some of the strategies that the Fed could use to minimize policy regret?
8. Why does the Fed now establish long-term economic projections four times a year rather than two times?
9. What is an irregular variance? How does it affect Fed behavior?
10. "The Fed should do everything it can to eliminate inflation." Do you agree? Explain.
11. What should the Trading Desk do if the fed funds rate falls below the targeted rate?
12. Explain what is meant by the *reserve need.*
13. Why and how has the Fed become more open about monetary policy decisions in recent years?
14. What are the Temporary Auction Facility, the Primary Dealer Credit Facility, and the Term Securities Loan Facility? Why were they created?

Analytical Questions

16. Find the minutes of the most recent FOMC meeting, either at the library in the Federal Reserve Bulletin or on the Internet at **www.federalreserve.gov.** (Because the FOMC meets about every six weeks, minutes appear in 8 of the 12 monthly issues of the *Federal Reserve Bulletin.*) Summarize the policy directive.

Suggested Readings

Inflation and unemployment rates since the 1940s are available on the Internet at **http://research.stlouisfed.org/fred2/.**

Information on unemployment and inflation can also be found at **http://www.whitehouse.gov/news/fsbr.html.**

Data and tables on inflation can be seen at **http://www.clevelandfed.org/Research/Data/mcpipr.htm.**

In compliance with the Humphrey-Hawkins Act of 1978, the Fed must report its long-term goals to Congress in February and July of each year. See the latest Monetary Policy Testimony and Report to Congress by the chair of the Board of Governors of the Fed at **http://www.federalreserve.gov/boarddocs/hh/.**

Downloadable papers that describe the general purpose and goals of monetary policy can be found at **http://www.federalreserve.gov/pf/pf.htm.**

Robert Rich and Charles Steindel make "A Comparison of Measures of Core Inflation," *Economic Policy Review*, Federal Reserve Bank of New York, 13, no. 3 (December 2007).

Charles Steindel looks at "U.S. Policy and the Changing Global Landscape," *NABE News*, no. 186, April 2007.

Argia Sbordone looks at "Inflation Persistence: Alternative Interpretations and Policy Implications," *Journal of Monetary Economics* 54, no. 5 (July 2007).

For those interested in "How Theory Is Shaping Monetary Policy," see V.V. Chari and Patrick J. Kehoe's article by the same name in the Federal Reserve Bank of Minneapolis 2006 *Annual Report*. It is available online at **http://www.minneapolisfed.org/publications_papers/pub_display.cfm?id=3183**.

A highly recommended and comprehensive speech about monetary policy by former Fed chair Alan Greenspan highlights the risk management aspects of monetary policy during his tenure. The speech, titled "Risk and Uncertainty in Monetary Policy," was given before the American Economics Association, January 3, 2004, in San Diego, California. A transcript is available on the Internet at **http://www.federalreserve.gov/boarddocs/speeches/2004/20040103/default.htm**

Stephen G. Cecchitti, "Policy Rules and Targets: Framing the Central Banker's Problem," discusses many of the topics in this chapter. It can be found in *Economic Policy Review*, Federal Reserve Bank of New York, 4, no. 2 (June 1998): 1–14.

The minutes of each FOMC meeting, including the directive, are published in the *Federal Reserve Bulletin* each month immediately after the minutes are released. They make extremely interesting reading. This information is also available on the Web site of the Federal Reserve Board at **http://www.federalreserve.gov/.**

Two recent speeches by Fed governors that discuss the state of the U.S. economy and monetary policy in early 2008 are "The U.S. Economy and Monetary Policy," by Donald L. Kohn, available at **www.federalreserve.gov/newsevents/speech/kohn20080226a.htm,** and "Financial Market Turmoil and the Federal Reserve: The Plot Thickens," by Kevin Warsh, available at **www.federalreserve.gov/newsevents/speech/warsh20080414a.htm.**

An article that looks at the "rules versus discretion" debate is Douglas Clement, "The Veil of Discretion: Does the Fed Have Too Much Freedom," *The Region*, Federal Reserve Bank of Minneapolis, 18, no. 2 (June 2004): 10.

For a look at a risk management approach to policy, see "Monetary Policy Under Uncertainty," remarks by Chairman Alan Greenspan at a symposium sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming (August 29, 2003). The remarks are available on the Internet at **http://www.kc.frb.org/Publicat/sympos/2003/pdf/Greenspan.0902.2003.pdf.**

For a look at issues involving policy regret, see Sharon Kozicki, "How Do Data Revisions Affect the Evaluation and Conduct of Monetary Policy?" *Economic Review*, Federal Reserve Bank of Kansas City, 89, no. 1 (First Quarter 2004): 5–35.

Information on open market operations and their important role from a monetary policy perspective is available online at **http://www.newyorkfed.org/aboutthefed/fedpoint/fed32.html**.

Another interesting discussion about Fed openness is a speech by Fed Governor Frederic S. Mishkin to the Undergraduate Economics Association, Massachusetts Institute of Technology, Cambridge, Massachusetts, November 29, 2007. Titled "The Federal Reserve's Enhanced Communication Strategy and the Science of Monetary Policy," the speech is available online at **http://www.federalreserve.gov/newsevents/speech/mishkin20071129a.htm.**

Fed Governor Frederic S. Mishkin discusses "The Federal Reserve's Tools for Responding to Financial Disruptions" in a speech at the Tuck Global Capital Markets Conference, Tuck School of Business, Dartmouth College, Hanover, New Hampshire, on February 15, 2008. The speech is available online at **http://www.federalreserve.gov/newsevents/speech/mishkin20080215a.htm.**

"Understanding the Recent Changes to Federal Reserve Liquidity Provision" is the subject of an article on the Web site of the Federal Reserve Bank of New York, available at **http://www.newyorkfed.org/markets/Understand_Fed_lending.html**.

Endnotes

1. A fascinating speech by Fed chair Greenspan that highlights the asymmetrical differences between inflation and deflation is "Risk and Uncertainty in Monetary Policy," given before the American Economics Association, January 3, 2004, in San Diego, California. It is available on the Internet at **http://www.federalreserve.gov/boarddocs/speeches/2004/20040103/default.htm**.
2. *Federal Reserve Bulletin* (September 1995): 853.
3. The policy directive and statement are available in the FOMC meeting minutes on the Internet at **http://www.federalreserve.gov/monetarypolicy/fomcminutes20080318.htm.**

PART 4

Financial Markets

11 The Money Markets

12 The Corporate and Government Bond Markets

13 The Stock Market

14 The Mortgage Market

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CHAPTER ELEVEN

11

The need for a money market arises because receipts of economic units do not coincide with their expenditures.

—Timothy Q. Cook and Robert K. LaRoche

The Money Markets

Learning Objectives

After reading this chapter, you should know:

What the money market is and how it is used by various participants

Recent trends in money market instruments

How the money markets have become international in scope

What money market mutual funds are and why they have become important intermediaries

FINANCIAL MARKETS

In Part 4 of this text, we examine debt and equity markets more closely. The next three chapters look at the various capital markets, where financial assets with a maturity of greater than one year (or no maturity at all) are traded. Capital markets include the bond, stock, and mortgage markets and we spend a chapter discussing each one. In this chapter, we look at the **money market**—the short-term credit market where debt securities having original maturities of one year or less are traded. This definition distinguishes the money market from the capital market for longer-term debt and equity transactions. We begin by exploring how various participants use money market instruments to meet their borrowing and lending needs. In the second section, we review the individual money market instruments (originally covered in Chapter 3) and the development of **money market mutual funds (MMMFs).**

Money Market
The market for financial assets with an original maturity of less than one year.

Money Market Mutual Funds (MMMFs)
Short-term investment pools that use the proceeds they raise from selling shares to invest in various money market instruments.

MONEY MARKET CHARACTERISTICS, BENEFITS, AND PARTICIPANTS

Despite their name, money markets are not used for trading currencies or the components of M1, our most narrow measure of money. Currencies are traded on foreign exchange markets as described in Chapter 8. Similarly, none of the instruments in M1 (currency in the hands of the public, checkable deposits, and travelers' checks) are traded in money markets. However, most money market instruments are highly liquid assets that could be classified as near monies and hence the name is not completely misused.

The major money market instruments include fed funds, negotiable certificates of deposit (CDs), Treasury bills, commercial paper, Eurodollars, repurchase agreements, and money market mutual fund deposits. Although there are as many different types of money markets as there are instruments, people often refer to these markets in the singular, as a money market. This is because money market instruments share many characteristics. First, they are *issued in large denominations*, usually of $1 million or more. This feature, along with their absence of reserve requirements and lower regulatory burdens when compared to checkable deposits at depository institutions, makes money markets an efficient place for raising and storing short-term funds. The large denominations also limit their use primarily to institutional investors. Large institutions that are wholesale borrowers and lenders in the money market include commercial banks and savings associations, governments and government-sponsored enterprises (GSEs), the Federal Reserve, corporations and finance companies, pension funds and insurance companies, and securities brokers and dealers. With the exception of money market mutual fund shares, money market instruments are rarely used in retail markets where most individual investors purchase securities. Second, money market instruments *have short maturities*, typically less than three months, but ranging from one day to one year. Third, money market instruments are characterized by *low liquidity and default risk*. Short maturities and active resale markets for most instruments provide considerable insulation from liquidity risk. (Exhibit 11–1 shows that only repurchase agreements and nonnegotiable Eurodollar time deposits lack secondary markets.) Their sale by some of the most creditworthy borrowers, namely the federal government and large financial and nonfinancial corporations, lowers an investor's exposure to default risk. Investor risk exposure is further reduced by some **commercial paper** and bankers' acceptance issuers contracting with banks to provide liquidity through credit lines and protection against default through payment guarantees. However, it should be noted that the liquidity and credit quality of some money market instruments was called into question in the financial crisis of 2008, and like other financial markets, this market has been profoundly

Commercial Paper
Short-term debt instruments issued by corporations.

Instruments	Typical Maturities	Principal Borrowers	Secondary Market
Federal funds	Chiefly 1 business day	Depository institutions	Active brokers' market
Negotiable certificates of deposit (CDs)	1 to 6 months and longer	Depository institutions	Modest activity
Bankers' acceptances	90 days	Financial and business enterprises	Limited
Eurodollars			
Time deposits (non-negotiable)	Overnight, 1 week, 1 to 6 months, and longer	Banks	None
CDs (negotiable)	1 to 6 months and longer	Banks	Moderately active
Treasury bills	3 to 12 months	U.S. government	Very active
Repurchase agreements	1 day, and terms of 2 days to 3 months typical; 6 months less typical	Banks, securities dealers, other owners of securities, nonfinancial corporations, governments	None, but very active primary market for short securities
Federal Agencies (Government-sponsored enterprises)			
Discount notes	30 to 360 days	Federally sponsored agencies	Active
Coupon securities	6 to 9 months	Federal National Mortgage Association, Federal Farm Credit Banks Funding Corporation, Student Loan Marketing Association	Active
Commercial paper	1 to 270 days	Financial and business enterprises	Moderately active
Municipal notes	30 days to 1 year	State and local governments	Moderately active for large issuers

Source: Ann-Marie Meulendyke, *U.S. Monetary Policy & Financial Markets* (New York: Federal Reserve Bank of New York, 1998), p. 81.

affected by the crisis. Fourth and finally, unlike commodities or stocks that often trade on specific exchanges, the money market *does not occupy one particular geographic location or trading floor.* The market tends to be centered in New York City, but it consists of borrowers and lenders as well as brokers and dealers linked by telecommunications throughout the nation and increasingly around the world. Exhibit 11–1 summarizes the instruments used, as well as their typical maturities, principal borrowers, and the status of their secondary market, if any, for each instrument.

BENEFITS

As the quote that opens this chapter suggests, financial and nonfinancial businesses as well as governmental entities generally experience flows of receipts and expenditures at different times. To manage this mismatch in cash flows, economic agents of all types have periods when they need to borrow and other periods when they have funds to lend. Banks and finance companies do provide a variety of different types of loans and lines of

credit to businesses temporarily short on funds. Depository institutions also stand ready to serve as a place for businesses to store their excess funds and to avoid the opportunity cost of lost interest earnings.

Borrowing in the money market—relative to borrowing from a bank—was often a more efficient source of credit for the largest financial institutions, nonfinancial corporations, and governmental bodies. The advantages of the direct lending process over bank borrowing stemmed from two sources. First, banks were historically required to hold non-interest-bearing required reserves as vault cash or deposits at the Fed. Thus, only 90–97 percent of their domestic transactions deposits could be lent out. Because of this, banks had to charge a higher rate of interest on loans in the money market to compensate for the fact that reserves did not earn any interest. However, in late 2008, the Fed immediately authorized the payment of interest on reserves to help mitigate the ongoing financial crisis. This sped up the onset of permanent legislation that had previously been passed and which would have allowed for the payment of interest on reserves beginning in 2011—hence, this disadvantage for banks is no longer relevant. Second, banks face regulatory constraints on the size of loans they can make to one particular borrower and the particular types of assets they are allowed to hold on their balance sheet. In the past, Glass-Steagall's Regulation Q even limited the amount of interest that banks could pay to their depositors and state-imposed usury ceilings limited the interest rates banks could charge to customers. These regulatory strictures have placed banks and other financial intermediaries at a competitive disadvantage relative to direct finance in the less restricted and less regulated money market. As of 2009, although many of the historical advantages of the money market had been removed, the money market was still an efficient place for large financial and nonfinancial firms to "park" funds for a short time.

Since you have already had a brief introduction to money market instruments in Chapter 3, we will begin here with a discussion of how money market participants use these securities. This chapter subsequently provides an in-depth discussion of each money market instrument and money market mutual funds.

PARTICIPANTS

Commercial Banks and Savings Associations

Commercial banks and savings associations play five important roles in the money market. First, they borrow in the money market to meet their reserve needs or to make loans to their commercial or household customers. These funds are raised by borrowing in the federal (fed) funds and eurodollar markets, by issuing negotiable certificates of deposit (CDs), and/or by entering into repurchase agreements (RPs). Some large bank and financial holding companies also issue commercial paper. Second, commercial banks and other depository institutions hold significant levels of T-bills on the asset side of their balance sheets. These liquid assets earn interest and help manage cash-flow needs. Third, large commercial banks and savings associations assist other participants by providing credit enhancements for a fee to those issuing commercial paper and bankers' acceptances. When a corporation issues commercial paper they often approach a bank to provide a **backup line of credit.** This credit line is drawn on by the corporation in the event that it is unable to retire or roll over its payment obligations. In the case of serious credit deterioration on the part of the issuer, banks can withdraw lines of credit before they are used to pay off maturing commercial paper. A stronger form of credit enhancement offered by banks is **letters of credit.** These guarantee that a bank will redeem a security, such as a bankers' acceptance, if the issuer does not. By reducing risk, these guarantees also lower the interest rate at which a security issuer can borrow. Fourth, many large banks serve as agents and underwriters in the commercial paper market. Finally,

Backup Line of Credit
A bank's promise to lend funds to a borrower on demand. These are often used to assist commercial paper issuers with their payment obligations.

Letters of Credit
A form of credit enhancement offered by banks that guarantees a bank will redeem a security if the issuer does not.

the largest money center banks, such as Citigroup, Bank of America, and JPMorgan are affiliated with securities firms such as Citigroup Global Markets Inc., Bank of America Securities LLC, and J.P. Morgan Securities, Inc., that serve as primary dealers of U.S. government securities. This enables them to trade money market securities directly with the Fed on behalf of their corporate customers.

In addition to these roles, some commercial banks play the role of dealer in the over-the-counter interest rate derivative market. This has facilitated the use of derivatives by other intermediaries in managing interest rate risk. Although short-term interest rate swaps, financial futures, and options are money market instruments, we save our discussion of these derivative instruments for Chapters 23 and 24.

Governments and Government-sponsored Enterprises (GSEs)

The U.S. Treasury is the world's single largest borrower in the money market. It issues U.S. Treasury bills (T-bills), which are money market instruments, as well as Treasury notes and bonds that have longer maturities and are classified as capital market instruments. Like other participants, the federal government's revenues and expenditures fail to coincide. By issuing new T-bills, the government can finance its expenditures until tax revenues are received and it can pay off previously issued T-bills as they mature.

Although they primarily issue longer-term securities, privately owned government-sponsored enterprises (GSEs) such as Federal National Mortgage Association (Fannie Mae), Federal Home Loan Mortgage Corp. (Freddie Mac), and Student Loan Marketing Association (Sallie Mae) have increasingly used the money markets as a source of funds for their various endeavors. Most GSEs are engaged in assisting with the finance of housing, agriculture, or education. GSEs are widely perceived as having an implicit government guarantee on their debt. As a result, they are able to borrow at lower interest rates than they otherwise would. Note that as we shall see in Chapter 21, Fannie Mae and Freddie Mac were put into receivership by the U.S. government in September 2008 as part of the bailout plan to save the financial system. Although stockholders lost, those who purchased securities issued by Fannie and Freddie did not.

State and municipal governments issue short-term municipal notes to finance their own expenditures as well as that of local schools, hospitals, and special districts. The interest investors earn on these securities is generally exempt from federal taxation. This exemption allows state and local governments to borrow at a lower cost (offer lower pre-tax yields) than they otherwise could.

The Federal Reserve

The Fed plays a pivotal role in the money market and, through it, in the economy as a whole. Through the open market purchase and sale of Treasury bills or repurchase agreements, the Fed controls the level of reserves available to depository institutions. When the Fed buys securities, it pushes reserves into the system and drives down the fed funds rate. When it sells securities, the Fed pulls reserves out of the system and drives up the fed funds rate. Movements in the federal funds rate in turn affect money market and other interest rates in the same direction. Similarly, changes in interest rates influence consumer purchasing and business investment behavior, which are important components of economic output. One can see that the Fed's monetary policy actions are primarily conducted in the money market. In addition to this important policy role, the Fed also serves as the Treasury's agent in the government securities market and helps to make a market in Treasury securities.

As part of its efforts to mitigate the financial crisis of 2008, the Fed also has taken action to assist money markets that are caught up in this crisis. As noted in Chapter 10,

in September 2008, the Fed created the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF), which was a temporary lending facility to assist money market mutual funds that were experiencing disintermediation as depositors withdrew uninsured deposits. Under the program, depository institutions and bank holding companies could now borrow from this facility and use the proceeds of the loans to purchase high-quality asset-backed commercial paper from the strained money market mutual funds. On the same day, the Treasury announced a temporary program that extended deposit insurance to money market mutual fund deposits that paid a premium for the coverage. Note that there was not the $250,000 limit on the amount of coverage per account, as there is for insured deposits at commercial banks. There was in fact no limit on the insurance coverage per account. By extending this coverage, the Treasury hoped to stop the run on money market mutual funds that would further hurt the global financial system. The program expired in September 2009.

Corporations and Finance Companies

Finance companies and other corporations use the money markets both to raise and store funds. Finance companies in particular issue large amounts of commercial paper as a primary source of funds. They lend these funds to individuals to finance automobiles, boats, homes, home improvements, and as other unsecured personal loans. They lend to firms so they can purchase inventories, equipment, or real estate. Other corporations tend to issue commercial paper to make up for temporary shortfalls of cash. When surplus cash is available, corporations and finance companies use it to buy the money market instruments issued by commercial banks, governmental units, and other businesses. Most of these can be easily resold if cash needs arise.

Pension Funds and Insurance Companies

Pension funds and insurance companies alike find it useful to maintain some portion of their investment portfolios in various money market instruments. These instruments can be easily sold to meet unexpected payments or to purchase additional stocks and bonds. Casualty and property insurers in particular are susceptible to less predictable claims and need a greater degree of liquidity than do life insurers or pension funds. In short, like other businesses, pension funds and insurance companies use the money market for cash management purposes and to provide a degree of liquidity otherwise lacking in their portfolios.

Brokers and Dealers

Among the most important participants in the money market are the brokers and dealers that ensure its regular functioning. These participants market the new issues of money market securities and stand ready to purchase these securities, thereby facilitating the establishment of a secondary market for federal funds, negotiable CDs, bankers' acceptances, Eurodollar CDs, T-bills, government agency securities, commercial paper, municipal notes, and various derivative products. Dealers, who take ownership positions in these securities, tend to use repurchase agreements to finance their inventories of other money market instruments. The way this usually works is that a dealer sells some of its securities to a lender and promises to buy them back at some point in the near future. The term is typically overnight or for a few days or weeks. When the dealer repurchases the securities, he or she repays the lender the principal amount of the loan as well as the accumulated interest. In many ways this looks like a secured loan with the dealer's secu-

rities serving as collateral. To protect the lender, the amount loaned is generally less than the dollar value of the securities sold. Dealers also act as intermediaries in the RP market by borrowing from those wishing to lend, and lending to those who desire to borrow. Brokers do not take ownership positions. They match buyers and sellers of money market instruments and earn a commission on each sale.

Money Market Mutual Funds and Individuals

The last participants we need to discuss are money market mutual funds and individuals. Before 1978 few individuals participated directly in the money market. The denominations involved, at the time, were $10,000 for a Treasury bill or $100,000 for a negotiable CD. These were simply too large for all but the very wealthiest investor to purchase. However, the combination of higher interest rates and Regulation Q interest-rate ceilings on deposit interest rates in the late 1970s created the incentive for financial innovation. In 1978 Merrill Lynch created short-term investment pools called money market mutual funds. MMMFs use the proceeds they raise from selling shares to invest in commercial paper, repurchase agreements, certificates of deposit, Treasury bills, bankers' acceptances, and other U.S. and foreign short-term debt securities. This single innovation has allowed individual investors to benefit from the higher returns and safety of the money market previously restricted only to institutional investors. We will have more to say about these intermediaries and the changes they have been experiencing at the end of the chapter.

Recap The money market is the market for short-term credit. Instruments issued here are characterized by large denominations, short maturities, low risk, and lack a central trading floor. Because of these characteristics and relatively little regulation compared to depository institutions, the money market is a low-cost place to raise and store funds. A wide variety of institutions use the money market to manage the common mismatch in timing of revenues and expenditures they experience. Users of the market include commercial banks, savings associations, governments and government-sponsored enterprises (GSEs), the Federal Reserve, financial and nonfinancial corporations, finance companies, pension funds, insurance companies, and brokers and dealers. In addition, money market mutual funds (MMMFs) allow individuals to participate in the money market.

MONEY MARKET INSTRUMENTS

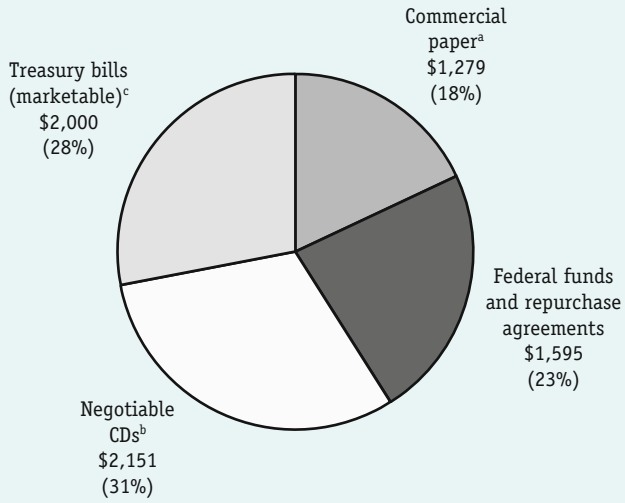
Exhibit 11–2 shows the amounts outstanding of various money market instruments as of June 30, 2009. Below we discuss money market instruments in detail.

Commercial Paper

Corporations and foreign governments issue unsecured short-term promissory notes called commercial paper as an alternative to short-term bank loans or other forms of borrowing. The primary benefit to the largest and most creditworthy commercial paper issuers is that the cost of borrowing is lower than it would be at a commercial bank. The interest rate on commercial paper tends to be about two to three percentage points lower than the prime rate that commercial banks charge to their best corporate customers. In addition, the costs of issuance, even through a dealer, are extremely low. When one considers that there is about $1.3 trillion dollars of commercial paper outstanding in mid-2009, shaving even a couple of percentage points from the interest rate charged reduces the annual cost of borrowing by billions of dollars!

11-2
The Money Market: Relative Shares of Money Market Instruments Outstanding as of June 30, 2009

Figures are in billions of dollars



a. Includes commercial paper issued by both financial and nonfinancial firms.
b. Because of changes in data gathering, large time deposits are substituted for negotiable CDs.
c. Treasury bill data is from June 30, 2009, and does not include nonmarketable debt used for off-budget programs such as social security.
Source: All data (except for the T-bill data) come from Board of Governors of the Federal Reserve System, Washington, DC, available at www.federalreserve.gov/releases. Treasury bill data are from the Bureau of the Public Debt's "Monthly Statement of the Public Debt," available at www.publicdebt.treas.gov. Percentages do not sum because of rounding.

The characteristics of commercial paper issues are largely defined by legislation and issuers' attempts to avoid the costly disclosure requirements mandated for other types of securities. The Security Act of 1933, which created the Securities and Exchange Commission (SEC), requires that securities sold to the public must be registered with the SEC. Registration in turn requires comprehensive public disclosure, including the preparation of a prospectus describing the firm issuing the security and the details of the specific offering. However, these time-consuming and expensive requirements can be avoided if the following three requirements are met: (1) the paper issued must mature in less than 270 days, (2) it must be issued in large denomination so it is not typically purchased directly by the public, and (3) the proceeds must be used to fund current transactions. Commercial paper is designed to meet all three of these criteria and avoid disclosure requirements. Most commercial paper matures in 5–45 days, with the average being about 30 days. Minimum denominations are usually $100,000. However, since amounts can be customized for the buyer upon request, minimum face values sometimes fall as low as $10,000. More typically, commercial paper is sold in multiples of $1 million to meet the needs of institutional investors. Usually commercial paper is sold on a discount basis; the buyer pays something less than face value. At maturity the buyer receives the higher face value and the difference between the two is the interest earnings. In some cases, commercial paper can be issued on a coupon basis at the request of an investor. Finally, as required by the Security Act, the funds raised are used for current transactions or to temporarily finance construction projects until bonds can be issued.

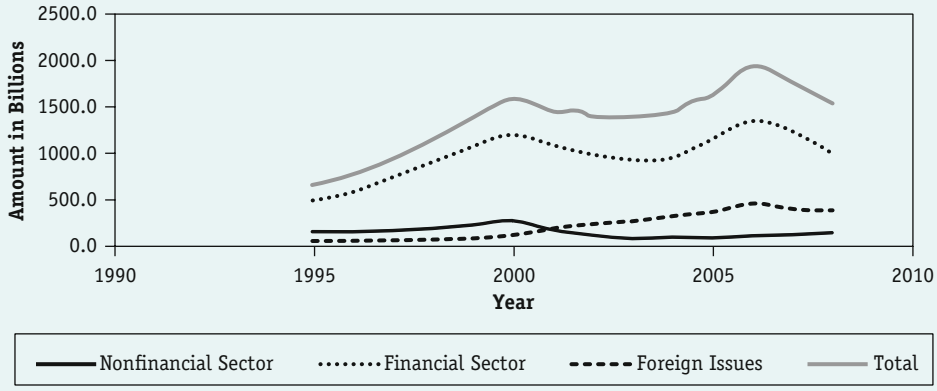
Many different types of companies and governmental units raise funds in the commercial paper market. Since 1995 a small but growing part of the commercial paper market comes from foreign companies and governments. As of June 30, 2009, foreign banks, bank holding companies, and corporations, as well as foreign governments, issued about $345.7 billion of the approximate $1.3 trillion commercial paper outstanding. Japan, the United Kingdom, and France are among the countries with the largest commercial paper issuers. Exhibit 11–3 shows the U.S. and foreign commercial paper outstanding from 1995 to 2008.

In terms of types of companies, financial companies (specifically nonbank financial companies) are responsible for issuing a large portion of both domestic and foreign paper and the largest *financial* issues are made by finance companies. Finance companies use the funds raised in the commercial paper market to make consumer loans for vehicles, real estate, and unsecured personal loans as well as to firms for inventories, equipment, and commercial property. These nonbank finance companies include such household names as General Electric Capital (a finance subsidiary of GE) and Ford Motor Credit. These firms borrow in the commercial paper market and then lend these funds to consumers purchasing the products of their parent companies.

In addition to finance companies, many other insurance and securities firms, commercial bank holding companies, public utilities, state and local governments, and industrial and service companies raise funds with commercial paper. The funds are used to fund inventory purchases, manage accounts receivable, or meet other current expenses. The liquidity raised can enable the issuer to take advantage of cash discounts on inventory deliveries and/or to maintain its bank credit lines as a reserve for unexpected cash-flow problems. Some firms and municipalities issue commercial paper monthly so that it becomes a semi-permanent form of financing. This does not violate the "current transactions" requirement of the Security Act, because the rolling-over of the debt is at the discretion of the issuer. Furthermore, the buyer is under no obligation to purchase the newly rolled-over issues.

In recent years, close to half of the commercial paper issued has been asset-backed commercial paper. That is, the commercial paper is backed by a pool of assets such as accounts receivable or various types of loans. Asset-backed commercial paper has increased

11-3
U.S. and Foreign Commercial Paper Outstanding, 1995–2008



Annualized through September 30, 2008.
Source: Federal Reserve Board of Governors, Flow of Funds of the United States, December 11, 2008 and Flow of Funds Accounts of the United States, 1995–2004, December 11, 2008.

the liquidity of the financial system by allowing illiquid debts to be packaged together and sold off as liquid assets to investors. However, it does not come without some risks. There is a concern that lenders may be less rigorous in evaluating credit risk if they know the loan will be sold off with a pool of other loans. This is similar to the decrease in market discipline (moral hazard problem) caused by the creation of mortgage-backed securities. In early 2008, the crisis in the mortgage-backed security market has also spread to this market. In September 2008, as noted in Chapter 10, the Fed created a special lending facility to support the asset-backed commercial paper market.

Direct Placements
When the issuer of a security sells straight to a buyer without the assistance of a broker or dealer.

Companies can issue commercial paper through a dealer or engage in **direct placements.** As the name suggests, in a direct placement the issuer sells directly to the buyer without the assistance of an outside dealer. Large, well-known financial firms are much more likely to use direct placements. Since they rely on it as a semi-permanent form of financing, it makes sense for them to create in-house vehicles to manage the periodic issuance of paper. The remaining commercial paper is sold through dealers. Investment banks serve as dealers in the commercial paper market. Dealers earn their fees by purchasing the paper for less than they sell it. This spread is thin, equaling only about one-eighth of one percent (.00125 percent) of the face value of the issue. A large issuer with $400 million worth of paper outstanding for a year would generate fee revenue for the dealer of $500,000. Given the heterogeneous rates, maturities, and face values of commercial paper, it is difficult to bundle blocks of paper together to securitize and resell in a secondary market. Thus, dealers play another important role in this market, creating a modestly active secondary market by purchasing paper from investors in need of cash.

The rates that individual issuers pay to borrow are strongly influenced by the perceived risk of the borrower. Since the first serious disruption of the commercial paper in 1970—the $82 million default of Penn Central Transportation Company—most issuers have paid to have their commercial paper issues rated. Companies such as Moody's and Standard & Poor's provide up-to-date information and ratings to those investors subscribing to their publications or information services. As noted earlier, most issuers turn to commercial banks for backup liquidity and other credit enhancements to further reduce default risk.

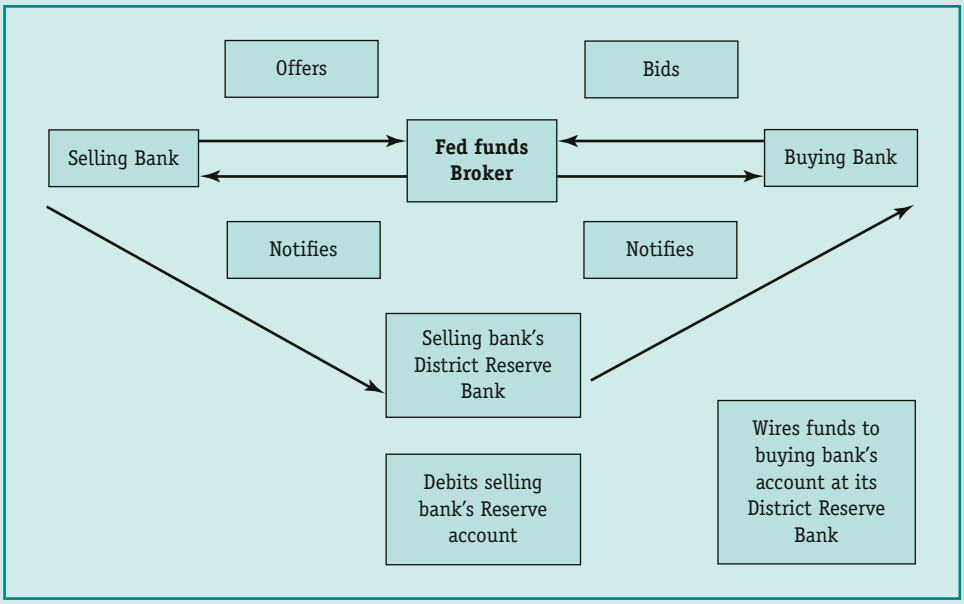
A variety of different kinds of investors purchase commercial paper. These include money market mutual funds, large insurance companies, nonfinancial businesses, bank trust departments, and pension funds. The attraction, of course, is that these securities are characterized by low default risk, short maturities, and relatively high yields when compared to other securities with similar risk and maturities.

Federal (Fed) Funds

Federal (Fed) Funds
Loans of reserves (deposits at the Fed) between depository institutions, typically overnight.

Commercial banks, savings associations, and credit unions are all required by the Federal Reserve to hold reserves for the purpose of managing monetary policy. Reserves can be held as vault cash or as deposits at the Fed. When institutions anticipate that they will have insufficient reserves, they often turn to the **federal (fed) funds** market. Here they can borrow reserves from other institutions on an overnight basis. Similarly, institutions that find themselves with excess reserves can turn to the fed funds market to loan these reserves and earn interest. Typically, fed funds are lent on an overnight basis in denominations of $5 million or more. In some cases they can be rolled over or established for a fixed term of a few days or a few weeks. Usually the loans are unsecured and booked based only on a verbal agreement between the lender and borrower. As an added bonus to the borrower, the funds are exempt from reserve requirements and have been free of interest-rate ceilings since their creation in the summer of 1921.

The Broker's Role in the Federal Funds Market



Banks hold a portion of their reserves as deposits at the Federal Reserve. The federal funds market is where banks trade these immediately available reserve balances to meet their required reserve balances. A description of how this typically works is sketched above and described below.

Brokers do not take positions; instead they take bids to sell and offers to buy from banks over the phone. They charge a mere 50 cents per $1 million commission on trades. Although this seems small, commissions can be considerable when one considers the large volumes involved. In the early 2000s, it was common for $250 billion in fed funds to change hands—daily! When bid and offer terms correspond, the broker sends notification to both the selling and buying bank. (Bids and offers typically differ by only 1/16 or 1/8 of a percentage point.) Once the terms have been agreed upon, the bank selling its reserve balances notifies its Federal Reserve district bank to debit its account for the amount of the loan. The Federal Reserve district bank then wires these funds to the buying bank's Federal Reserve District Bank. On the next business day, this transaction is reversed. The buying bank transfers funds back to the selling bank plus a day's worth of accumulated interest.

Source

Ann-Marie Meulendyke, *U.S. Monetary Policy and Financial Markets* (Federal Reserve Bank of New York, 1998), p. 86.

A commercial bank finding itself in need of reserves has a couple of places to turn to obtain fed funds. First, if the bank has an ongoing correspondent banking relationship with another bank, it can call this bank and see if it has reserves to lend. If it does, and a verbal agreement is arranged, a call is placed to the Federal Reserve district bank to wire funds from the lending bank's account to the borrowing bank's account. The next day the arrangement is reversed and the lending bank is paid one day's worth of interest. If our borrowing bank does not have a correspondent banking relationship or their correspondents are unable to make a loan, the bank can turn to a federal funds broker. Brokers take bids and offers from various banks and arrange federal funds transactions. In either case, fed funds transactions involve an overnight, self-reversing loan that takes place at a Federal Reserve district bank or between Federal Reserve district banks. Thus, fed funds serves as an appropriate name for this instrument, market, and interest rate.

Federal (Fed) Funds Rate
The interest rate charged on overnight loans of reserves among commercial banks.

The **fed funds rate** is determined by the interaction of supply and demand for reserves. When there is a shortage of reserves, the fed funds rate increases. When there is an excess supply of reserves, the fed funds rate decreases. As noted earlier, the Fed can manipulate the fed funds rate through open market operations—its buying and selling of government securities. When the Fed buys securities, it increases the supply of bank reserves in the banking system and puts downward pressure on the fed funds rate. Similarly, when the Fed sells securities, it is increasing the demand for reserves and putting upward pressure on the federal funds rate. Although few consumers directly participate in this market, the fed funds rate does impact their lives. When the federal funds rate increases, most other interest rates follow suit. Thus, the cost of borrowing on a credit card, home mortgage, or automobile loan is also likely to increase. And higher rates in turn are likely to dampen consumer expenditures, business investment, and in turn rates of economic growth. Now would be a good time to read the accompanying "A Closer Look," "The Broker's Role in the Federal Funds Market."

Repurchase and Reverse Repurchase Agreements

Repurchase Agreement
Short-term contract in which the seller agrees to sell a government security to a buyer and simultaneously agrees to buy it back on a later date at a higher price.

The same shortage of reserves that leads banks to borrow funds in the federal funds market leads some banks to engage in **repurchase agreements.** Repurchase agreements (RPs or repos) are short-term agreements in which the seller (the borrower of funds) simultaneously sells a government security to a buyer (lender of funds) and agrees to buy the government security back on a later date at a higher price. In short, from the initial seller's perspective, it looks like a collateralized loan.[1] Since collateral is usually transferred, repurchase agreements are viewed as safer than federal funds loans. This explains why the interest rate associated with repurchase agreements is typically lower than the fed funds rate. From the lender's perspective this is still a better deal than holding cash that earns no return or holding T-bills that usually earn an even lower rate return than repos.

Reverse Repurchase Agreement or Matched Sale-Purchase (MSP) Agreement
A repurchase agreement viewed from the perspective of the initial buyer. Short-term agreements in which the buyer buys a government security from a seller and simultaneously agrees to sell it back on a later date at a higher price.

The most confusing thing about repos and reverse repos **(reverse repurchase agreements or matched sale-purchase (MSP) agreements)** is getting the names straight. When looked at from the *borrower's perspective* (from the vantage point of the one initially selling the security), the transaction described before is called a repo. When viewed from the *lender's perspective* (the one buying the security, agreeing to sell it back in the future, and supplying the funds), we refer to this as a reverse repurchase agreement or a matched sale-purchase (MSP) agreement.

In the past, the speculative actions of brokers and dealers in the repurchase agreements market have also proven to be disruptive to the regular functioning of the money market as well as to other institutions with which they do business. As the "Looking Back" feature, "Disruptions in the RP Market" illustrates, failures have occurred because

brokers and dealers have used the same security simultaneously in more than one repurchase agreement. Because of the layering of financial claims in our financial system, a small disruption in one part of the financial system can adversely affect the functioning of other parts.

There are two main differences between the fed funds and repo markets. First, in the repo market, nondepository institutions can participate. In addition to depository institutions, securities dealers, money market mutual funds, mutual funds, pension funds, nonfinancial corporations, and state and local governments use the RP market to borrow and lend large-denomination short-term funds. A second difference is that with fed funds, no collateral is transferred. In a typical repo, funds and securities are transferred simultaneously via Fedwire and then reversed at the end of the contract. Despite these differences, repurchase agreements and federal funds are close substitutes and their rates of return tend to move in the same direction. You can see why by thinking through an increase in the fed funds rate. Imagine a situation where the Fed sells securities, which pull reserves out of the banking system. This leads some depository institutions to borrow more federal funds to meet their reserve need and push up that interest rate. As the fed funds rate increases, some institutions instead turn to the RP market to raise funds. This puts upward pressure on the interest rate in this market as well. The same happens in reverse when interest rates in the fed funds market are falling.

Like other money market instruments, repos involve large-denomination short-term loans. They can be sold through a dealer or through private placement. Transaction amounts are usually at or above $25 million for terms of 1 to 15 days. Longer-term RPs have standardized maturities of one-, three-, and six-month periods and transaction amounts in blocks of $10 million. Occasionally amounts are negotiated under $100,000, but the smallest customary amount handled by securities dealers is $1 million. Short-term repos can be renewed or arranged on a continuing basis. The borrower receives only the negotiated repo rate of return. The rate of return on the underlying security or its coupon payment has no bearing on the repo rate of return. Companies regularly using repos to raise funds create a department to find counterparties to their desired repo or reverse repos transactions. However, many repos are arranged by brokers and dealers that match the borrowing and lending needs of various participants and earn a small commission on each trade. No secondary market exists for RPs.

The exact size of the repurchase agreements market is impossible to calculate because many participants are not required to file reports. Most government data after the 1990s combine federal funds and repurchase agreement estimates.

Most money market instruments have maturities that are so short it is impractical for the issuer to offer periodic "coupon" interest payments. Instead, most money market instruments are sold at a discount. To calculate the interest earned (or payable) on an RP, one uses Equation 11–1. This same equation can also be used to calculate the interest earned or rate of return for commercial paper instruments. (Just change the RP rate to the CP rate for commercial paper.) By changing the 360-day year used here to a 365-day year, and the RP rate to the T-bill rate, these modified equations can also be used to calculate the accumulated interest and investment yield on Treasury bills. The difference in days per year stems from differences in customary usage by market participants.

(11–1) $$\textit{Interest earned} = \textit{Funds invested} \times \textit{RP rate} \times \textit{(number of days/360)}$$

For example an overnight, $10 million RP at a 5.0 percent repo rate would yield an interest return of $1,388.89:

$$\$10{,}000{,}000 * .05 * (1/360) = \$1{,}388.89$$

Looking Back

Disruptions in the RP Market: Drysdale and ESM

Before its failure in 1982, Drysdale Government Securities, Inc., was a small, ambitious government securities firm and dealer in the repurchase agreement market. Drysdale made extensive use of reverse repurchase agreements. A typical set of transactions looked like this: Dealers wishing to borrow money would enter into an RP with Chase Manhattan Bank. Drysdale would then enter into a reverse RP with Chase and borrow the securities used in the initial RPs. In this respect, Chase served as a blind broker because it connected dealers who wanted to temporarily sell securities (borrow money)—and who knew nothing of Drysdale—with Drysdale, who temporarily wanted to buy securities (lend money).

Everything appeared to be working fine despite the fact that when Drysdale borrowed securities, it took advantage of the interest coupons coming due on these securities and sold the securities in the open market to capture this value. Drysdale basically bet that when it needed to pay back the coupon payments and the original securities, securities prices would have fallen because of increases in interest rates. Drysdale would then be able to purchase a cheaper security in the market to meet its payment obligations to Chase. As long as interest rates were increasing, Drysdale's strategy worked and the firm expanded rapidly. When interest rates fell, securities prices were pushed up, undermining its scheme.

On May 17, 1982, Drysdale announced that it would be unable to pay $160 million in interest payments it owed to Chase Manhattan Bank. The problem was difficult to unwind. Chase claimed it was simply playing the role of a broker and that Drysdale was responsible for paying back those dealers who had engaged in RPs with Chase. The dealers argued that they were dealing only with Chase and that Chase should be held accountable. Ultimately, Chase paid for the losses to avoid further market disorder. The Fed was forced to liberalize trading rules in the government securities market and to allow firms to borrow securities. This was done to prevent what Gerald Corrigan, then president of the Federal Reserve Bank of Minneapolis, called a "gridlock situation in the market with people failing to deliver securities." Losses wiped out Chase's second-quarter earnings in 1982, caused a sharp decrease in its stock market value, and adversely affected shareholders, regulators, and other market participants.

A similar tale can be told about ESM Government Securities, Inc. ESM, too, engaged in RPs and reverse RPs with a variety of institutions and municipalities. Its closest financial relationships were with the largest state-insured savings bank in Ohio, Home State Savings Bank of Cincinnati, and with the American Savings and Loan Associates of Miami, Florida. The essential problem was that ESM had promised the same securities to more than one lender. ESM was able to do this by offering the thrifts and municipalities with which it did business a higher rate of interest if they would avoid taking actual possession of the securities underlying their RPs. When ESM failed on March 4, 1985, total losses were estimated at $315 million. The biggest losses were Home State at $150 million and American Savings and Loan at $53.3 million. To make matters worse, when Home State's depositors learned of the problems, they started an old-fashioned bank run on the thrift. Worried depositors withdrew $90 million in just 2 or 3 days.

Given that the Ohio Deposit Guaranty Fund had only $136 million to insure the remaining 70 state-insured thrifts in the state, depositors rationally started bank runs on other thrifts across the state. By March 15, 1985, Ohio's governor ordered all state-insured thrifts to remain closed—the first such declaration since the banking holiday of 1933. Before permission was granted for a thrift to reopen, it had to qualify for federal insurance. In many cases, this required that a thrift merge with another institution.

Source

Closely adapted from Martin H. Wolfson, *Financial Crisis: Understanding the Postwar U.S. Experience,* 2nd ed. (Armonk, NY: M.E. Sharpe, 1994), pp. 82–84, 103–104.

If one instead knows the purchase price, the selling price, and the term, but wants to compute the repo rate, one would use the following equation. (The selling price received at maturity is sometimes referred to as the face or par value.)

$$RP\,rate = \frac{selling\ price - purchase\ price}{purchase\ price} \times \frac{360}{number\ of\ days} \tag{11–2}$$

The repo rate depends on the difference between the purchase and selling price, annualized over a 360-day year. For example, assume that the repo has an initial security purchase price of $9,998,611.11 and that it can be resold tomorrow for $10,000,000. This would yield a repo rate of 5 percent.

$$\frac{\$10{,}000{,}000 - \$9{,}998{,}611.11}{\$9{,}998{,}611.11} \times \frac{360}{1} = 5\%$$

Recap

Commercial paper refers to short-term, large denomination, unsecured promissory notes issued by the most creditworthy corporations as an alternative to bank borrowing. These may be offered through brokers or as direct placements. Fed funds and repurchase agreements are used primarily by depository institutions to meet their reserve requirements. Unlike fed funds, RPs are also used by securities dealers, money market and mutual funds, pension funds, nonfinancial corporations, and state and local governments. Fed funds consist primarily of overnight loans of reserves between banks. Repurchase agreements (repos) are short-term agreements in which a seller simultaneously agrees to sell government securities now and promises to buy them back in the future at a higher price. In effect, repurchase agreements look like collateralized loans secured with government securities.

Certificates of Deposit (CDs)
Debt instruments issued by commercial banks having a minimum denomination of $100,000, fixed interest rate, and that return the principal at maturity. They may be negotiable (tradable) or non-negotiable (not tradable).

Thrift CDs
Certificates of deposit issued by savings associations and credit unions.

Negotiable Certificates of Deposit (CDs)

Certificates of deposit (CDs) are term debt instruments issued by large commercial banks. When issued by large savings associations they are often referred to as **thrift CDs.** In either case, they pay the bearer a fixed interest rate and return the principal amount at maturity. Minimum denominations are $100,000, but $1 million is more typical. Maturities range from one week to 12 months. However, most are issued for one to three months. CDs cannot be redeemed prior to maturity. This term requirement distinguishes CDs from other demand deposit liabilities that can be withdrawn at any time.

Negotiable Certificates of Deposit (CDs)
Certificates of deposit with a minimum denomination of $100,000 that can be traded in a secondary market, most with an original maturity of 1 to 12 months.

CDs can be either negotiable or non-negotiable. **A negotiable certificate of deposit** may be resold to another party after their initial purchase whereas a non-negotiable CD or time deposit must be redeemed by the original buyer of the instrument. As with other deposits, the first $250,000 of a CD is insured. However, since most are issued in much larger denominations, buyers are exposed to default risk if an issuer goes bankrupt. The primary purchasers of negotiable CDs are nonfinancial corporations and money market mutual funds. Most negotiable CDs are sold directly by a bank to an investor. However, brokers and dealers do assist with the sale of negotiable CDs and typically deal in round lots of $25 million.

Interest rates on negotiable CDs tend to be higher than T-bill rates for three reasons. First, as already noted, CD holders are exposed to default risk because for most CDs only a portion of their deposit is insured. Second, unlike T-bills, earnings on CDs are subject to state and local income taxes. Third, the secondary market for CDs is much thinner than that of T-bills. Thus, negotiable CDs are less liquid than T-bills.

The history of CDs illustrates two of the dominant themes of this text: the importance of evolutionary change in financial instruments, markets, and institutions, as well as the globalization of financial markets. Following World War II, corporations replaced many of their demand deposit holdings with purchases of other higher-earning money market instruments. To entice corporations to return these funds, banks began issuing large negotiable CDs in 1961. National City Bank of New York (now Citibank) was the first issuer, and the Discount Security Corporation, a securities dealer, agreed to make a secondary market in the instruments. The market grew rapidly until 1966 when open market interest rates rose above the Regulation Q ceilings, limiting the amount of interest banks could pay on these CDs. (This problem arose again in 1969–1970.) Investors seeking higher returns turned elsewhere, leading to sharp decreases in the CD market. To manage this problem, banks turned to the commercial paper and Eurodollar markets for liquidity and most importantly created Euro CDs. Again, National City Bank took the lead. They offered dollar-denominated CDs in London in 1966 to get around the Regulation Q interest rate ceilings and to avoid the reserve requirements mandated on domestic deposits. Euro CDs continue to be issued and are mostly sold to institutional investors and large U.S. corporations. The term **"Euro CDs"** has come to refer to any CD issued by the foreign branch of the commercial bank in a foreign country denominated in the currency of the corporation's home country. In contrast, we use the term **"foreign CDs"** to refer to instruments issued by a commercial bank in a foreign country but in the denomination of that foreign country. An example could be the U.S. branch of a French bank issuing a dollar-denominated CD in the United States.

Euro CDs
Certificates of deposit issued by the foreign branches of commercial banks but denominated in the currency of the branch's *home* country (e.g., Citibank issuing a dollar-denominated CD in Japan).

Foreign CDs
Certificates of deposit issued by the foreign branches of commercial banks and denominated in the currency of the branch's *host* country (e.g., Citibank issuing a yen-denominated CD in Japan).

Following the failure of Penn Central Transportation Company in 1970 and the subsequent disruption of the commercial paper market referred to earlier, the Fed eliminated interest rate ceilings on large CDs with maturities of less than three months. This made it easier for banks to raise funds for financing commercial loans to businesses adversely affected by the disruption of the commercial paper market. In 1973, Regulation Q was eliminated for large CDs (>$100,000) of all maturities and they have not been reimposed. Except for the recession period of the mid-1970s, the CD market expanded steadily through the late 1980s. One of the main engines of growth was the creation of money market mutual funds. MMMFs pooled the funds of many small investors that were dissatisfied with the Regulation-Q-limited returns they were earning on their demand deposit and small (<$100,000) CDs. The MMMFs in turn purchased large quantities of negotiable CDs.

The savings and loan (S&L) crisis of the late 1970s and early 1980s led Congress to create money market deposit accounts (MMDAs) and Super NOW accounts in 1982. Banks and S&Ls used these new instruments as a source of funds and their use of CDs

fell precipitously. The secondary market in CDs was dealt a cruel blow with the failure of Continental Illinois in 1984. Active secondary-market trading depended on the perception by most participants that all CDs were pretty much the same and could be bought and sold through a broker or dealer. The failure of this large bank, as well as questions about the health of other commercial banks, led to a sharp curtailment of secondary market participation. By June of 1987 even the Federal Reserve had decided it was not worth the trouble to separately track negotiable and non-negotiable CDs. Instead they now collect data only on large time deposits issued by the largest U.S. banks.

U.S. Treasury Bills

During most of the years following World War II, the U.S. federal government ran budget deficits. This meant that in a typical year it spent more than it took in from tax revenues. Although the government ran a surplus from 1998 to 2001, the years since have seen relatively large deficits. As of 2008, tax revenues fall over $1 trillion short of federal expenditures and experts forecast that these will continue for several more years. This is due to the deep recession in the economy and record stimulus packages. As of August 31, 2009, the *Monthly Statement of the Public Debt* of the United States showed that our national debt stood at about $11.8 trillion. The federal government holds about $4.3 trillion of this, mostly in the Social Security "trust fund" and by the Fed to conduct monetary policy. This leaves a national debt of about $7.5 trillion outside of the federal government.

The U.S. Treasury Department has an entire division whose sole function is to finance the rolling over of this debt and to manage the ongoing mismatch in the timing of tax in-flows and government expenditures. To manage these tasks, the Treasury sells a variety of Treasury securities with various maturities and face amounts. Of particular interest to us in this chapter on money markets are its issues of short-term **U.S. Treasury bills (T-bills).** (We will explain longer-term Treasury notes and bonds in the next chapter.) As of June 30, 2009, the total amount of U.S. Treasury bills outstanding was just over $2 trillion. Treasury bills are sold with low minimum denominations and short maturities to a variety of different types of buyers. The minimum denomination of a T-bill is $100. This is relatively low compared to the usual $100,000 needed to buy commercial paper or negotiable CDs. T-bills have maturities of approximately 4 weeks, 13 weeks, 26 weeks, or 52 weeks. From time to time, the Treasury issues cash management bills with a maturity of 1 to 7 days. Among the largest buyers of Treasury bills are commercial banks, money market mutual funds, the Federal Reserve, individuals, and foreigners.

U.S. Treasury Bills (T-bills)
Short-term debt instruments of the U.S. government with typical maturities of 3 to 12 months.

Like commercial paper, Treasury bills are sold on a discount basis. One purchases a T-bill at a price below its face or par value. An investor earns interest by receiving the difference between the purchase price paid and the face value received at maturity. For example, one might pay $9,692.10 for a $10,000 security that will mature in 26 weeks. The difference between the price paid and face value of the security, $307.90, serves as the interest earnings. From this information we can calculate the auction price rate and the coupon equivalent or annualized yield in much the same way as we calculated the rates for repurchase agreements. Now is a good time to read the accompanying "Cracking the Code" on "Treasury Bill Auction Results."

As you probably surmised, original issues of T-bills are sold at regularly scheduled auctions. The 4-week, 13-week, and 26-week bills are sold each week. The 52-week bill is auctioned every 5 weeks. The volumes available for sale are announced a few days before the auction by the Treasury. Bids must be submitted to the Federal Reserve. Results are typically announced and the securities are issued three days later. Bids are of two types, **competitive bids** or **noncompetitive bids.** Competitive bids specify both the quantity desired and the discount rate offered. If the discount rate is within the

Competitive Bid
A bid that specifies both the quantity desired and the discount rate offered. If the discount rate is within the range accepted, the bidder is entitled to the entire quantity sought.

Noncompetitive Bid
A bid that includes only the number of bills desired.

range accepted, the bidder is entitled to the entire quantity sought.[2] Noncompetitive bids include only the number of bills desired. Noncompetitive bidders are guaranteed to receive the amount of T-bills they request. However, they must accept the market-determined price and discount yield. Since noncompetitive bids are limited to a $5 million maximum per bidder, only individuals and smaller firms participate. Collectively they purchase only a small fraction of all T-bills offered for sale. Individuals can make noncompetitive bids at no cost directly to the Federal Reserve Bank or U.S. Treasury. Some brokerages will also make bids on one's behalf. However, paying fees will sharply reduce effective yields if one is purchasing a single $10,000 T-bill.

The auction-pricing method used in government securities auctions changed significantly in 1998. Before then, government securities (including T-bills), were awarded to the highest bidders using a **multiple-price method.** The number of securities requested by noncompetitive bids were set aside, and then others were awarded beginning at the highest price (lowest yield) and descending until all the securities planned for sale were sold. This lowest accepted bid price (highest accepted yield) is called the **stop-out yield.** This method resulted in different buyers paying different prices for the securities at the same auction. Bidders had to be careful to avoid the "winner's curse" whereby a successful bidder is stuck paying a higher price (earning a lower yield) than that paid by other bidders. Noncompetitive bidders paid a price equal to the weighted average of all accepted bids. In an attempt to increase its revenue, the Treasury adopted a **uniform-price method** beginning November 2, 1998. The hope was that this method would eliminate the winner's curse and thereby evoke higher bids. Like before, the quantity of securities needed for noncompetitive bids are set aside. Bids are still ranked lowest to highest yield and orders are filled going up to the stop-out yield. However, now all competitive and noncompetitive bidders pay the same price and receive the same yield.

Multiple-Price Method
An auction method whereby the seller of securities accepts bids prior to selling securities. Sales are awarded beginning with the highest bidder and continuing toward the lowest until the desired number of securities has been sold. Buyers end up paying different prices for the same securities based upon their respective bids. The Treasury discontinued this auction-pricing method in November 1998.

Stop-Out Yield
The lowest accepted bid price or yield in a securities auction.

Uniform-Price Method
An auction method whereby the seller of securities accepts bids prior to selling securities. Sales are awarded beginning with the highest bidder and continuing toward the lowest until the desired number of securities has been sold. All buyers pay the same price for the securities based on the stop-out yield. The Treasury instituted this auction-pricing method in November 1998.

Treasury bills possess an absence of default risk and a high degree of liquidity. Because the federal government issues T-bills, they are regarded as free of default risk. Unlike individuals, when the federal government faces difficulty in meeting its debt payments it can either raise taxes or simply create money to pay off its debts. This explains why interest yields on T-bills are lower than those from commercial paper, negotiable CDs, or other money market instruments that are characterized by at least some degree of default risk. Both the primary and secondary markets for Treasury bills are well organized, have many participants, and trades can be arranged at very low transaction costs. One measure of the degree of liquidity is the spread between the price buyers are willing to pay (bid price) and the price at which sellers are willing to sell (ask price). Throughout the 1990s and early 2000s, bid-ask spreads have been 2 basis points (.02 percent) or less. Another distinctive quality of T-bills is that they are exempt from state and local income taxes. For investors facing these taxes, Treasury bills can offer a lower rate of interest than corporate securities and still provide a higher after-tax yield. Of course investors should not expect too much from their T-bills. For the high degree of safety involved, investors should expect to receive rates of return only slightly above the rate of inflation.

Eurodollars

Eurodollars are dollar-denominated deposit liabilities exempt from U.S. banking regulations. As you have learned throughout this book, financial innovation can be induced by a variety of causes. In the case of Eurodollars the spur was the Cold War and the threat of provocation. During the 1950s, Soviet officials worried that in a crisis, the U.S. government might freeze any U.S. dollar deposits that the USSR held in the U.S. banking system. To reduce this risk, the Soviets convinced London bankers to accept dollar-

Eurodollars
Dollar-denominated deposits held abroad.

Cracking the Code

Treasury Bill Auction Results

Here are the details of the Treasury's auction of 91-day and 182-day Treasury bills on December 15, 2008: All bids are awarded at a single price at the market-clearing yield. Rates are determined by the difference between that price and the face value.

	91-day	182-day
Applications	$76,560,361,700	$73,266,456,400
Accepted bids	27,000,009,599	$27,000,029,900
Accepted noncompetetively	1,308,361,700	$866,006,400
Auction price (rate)	99.987361 (.05%)	99.863500 (0.270%)
Coupon equivalent	.051%	0.274%
Bids at market yield	51.47%	64.37%

Bill issues are dated December 18, 2008. The 91-day bills mature March 19, 2009, and the 182-day bills mature June 18, 2009.

We focus on the 182-day security for purposes of illustration. One notices in the first and second rows that of the $73,266,456,400 worth of applications, only $27,000,029,900 (37 percent) were accepted. One can also see that two different interest rates are quoted for this security. The first is the T-bill discount price, labeled here as the "auction price (rate)" at 0.270 percent. The second is the "coupon equivalent," or annualized yield at 0.274 percent. These can be calculated in a way very similar to that used earlier with repurchase agreements. Business periodicals typically quote the T-bill discount or T-bill rate. This represents the difference of the purchase price from the par value in a simplified 360-day year:

$$\text{T-bill discount} = ((\text{par} - PP)/\text{Par}) * (360/n)$$

where par = face value at maturity
PP = purchase price
n = number of days of investment

We can substitute the figures from the December 15, 2008, auction for 182-day T-bills assuming a $100 face value for calculation purposes:

$$(\$100 - \$99.863)/100) * (360/182) = .0027 = 0.27\%$$

To find the true investment yield, or "coupon equivalent," one must divide the difference of the purchase price from the face, by the purchase price itself, and adjust for the portion of a 365-day-year used. Equation (11–4) illustrates.[a] These bond equivalent yields are always higher because they are divided by the purchase price instead of par value.

$$\begin{aligned}\text{T-bill annualized yield} &= ((\text{par} - PP)/PP) * (365/n)\\ &= (\$100 - \$99.863)/\$99.863) * (365/182)\\ &= .00274 = 0.274\%\end{aligned}$$

[a]Careful readers will note that Equation (11–4) is almost identical to Equation (11–2), which is used for repurchase agreements. Only the rate/yield has been renamed and "selling price" is changed to "par."

Source: www.treasurydirect.gov/instit/anceresult/press/preanre/preanre.htm.

International Banking Facilities (IBFs)
Financial institutions located in the United States that cater to the needs of foreign individuals, corporations, and/or governments. They allow non-U.S. residents to hold unregulated Eurodollar deposits.

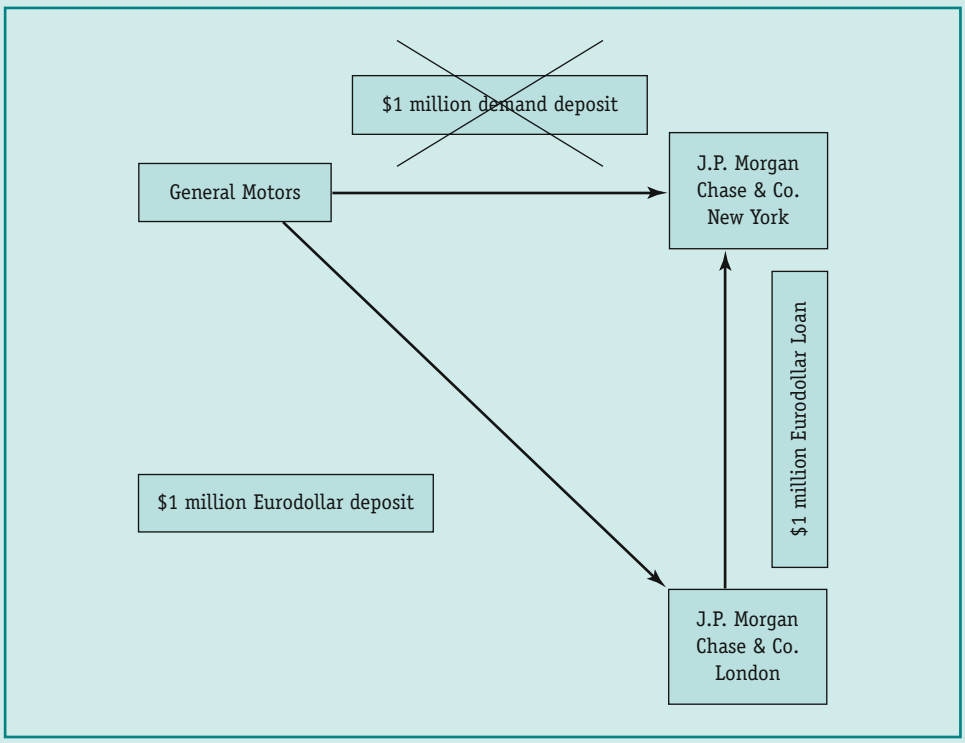
denominated deposits. Hence, you can see the origin of the name. Since that time, financial institutions around the world have begun accepting dollar-denominated deposits. Regardless of whether U.S. dollar-denominated deposits are held in Canada, Hong Kong, Japan, or Panama, we still refer to these as Eurodollars. Since 1981 it has even been possible for non-U.S. residents to hold Eurodollar deposits within the borders of the United States at financial institutions called **International Banking Facilities** (IBFs). These facilities help meet the credit needs of foreign individuals, corporations, or governments within the U.S.

Although Cold War tensions have eased, the Eurodollar market has continued to grow. The reasons for its persistence are simple. The Eurodollar market avoids many of the intermediation costs faced by domestic depository institutions. As the nearby "Closer Look" feature illustrates and explains, the foreign branch of a U.S. bank receiving a Eurodollar deposit easily avoids non-interest-bearing reserve requirements and deposit insurance premiums. A Eurodollar deposit also faces lower capital standards and less onerous financial supervision. In addition, transactions negotiated in London, or other

A Closer Look

The Anatomy of Eurodollar Borrowing

General Motors converts a $1,000,000 demand deposit at J.P. Morgan Chase & Co. New York to a Eurodollar deposit at J.P. Morgan Chase & Co. London. The New York bank branch was holding $100,000 in required reserve assets against the $1,000,000 demand deposit. J.P. Morgan Chase & Co. New York branch borrows the Eurodollar deposit from its London branch. The Eurodollar deposit then becomes a $1,000,000 nondeposit liability, free of reserve requirements. General Motors earns additional interest on the deposit, and J.P. Morgan Chase & Co. New York has $100,000 in additional funds to lend.



locations, can be posted in Nassau or the Cayman Islands to take advantage of lower tax rates in these locations. Some states in the United States have also changed their tax codes to provide preferential tax treatment to IBFs. These advantages allow Eurodollar-accepting institutions to pay higher rates of interest to their depositors and charge lower rates of interest to their borrowers.

Eurodollar deposits were initially held as non-negotiable fixed-rate time deposits. Given the lack of liquidity that characterized these securities, it should not be surprising to you to learn that over time negotiable Euro certificates of deposit (Euro CDs) devel-

oped that could be resold in a secondary market. Floating rate Euro CDs have also arisen to reduce interest rate risk for bearers of the securities. All of these instruments have maturities typically ranging from one week to six months, but can range from overnight to several years. Typical denominations range from $250,000 to $10 million dollars with some types of wholesale CDs having up to $30 million denominations that are later subdivided for individual investors. Several larger London banks participate in the interbank Eurodollar market. In many ways this market plays a role similar to that of the fed funds market among U.S. domestic banks. Although there are no reserve requirements imposed on Eurodollars, banks frequently find themselves temporarily short of reserves to meet their operating needs. In the fed funds market we talk about only one fed funds rate. However, we acknowledge that dealers earn a spread on the difference between bid and ask rates. In the Eurodollar market the spread on a 90-day Eurodollar CD borrowing is often reported in the financial press. The rate at which banks are willing to borrow funds is called the **London interbank bid rate (LIBID).** The rate at which banks are willing to lend funds is the **London interbank offered rate (LIBOR).** The spread between these to rates seldom exceeds more than one-eighth of a percent. They of course move up and down together and are closely correlated to changes in the American federal funds rate. The correlation to the fed funds rate should not be a surprise since fed funds and Eurodollar deposits serve as close substitutes for each other.

London Interbank Bid Rate (LIBID)
The interest rate at which London banks are willing to *borrow* Eurodollar balances.

London Interbank Offered Rate (LIBOR)
The interest rate at which London banks are willing to *loan* Eurodollar balances.

Bankers' Acceptances

Bankers' acceptances (BAs) allow a bank to "accept" responsibility or guarantee the payment of one of their customers. Historically, bankers' acceptances have been important in international trade where an export company may not know or be able to easily determine the creditworthiness of a foreign company that wishes to purchase its goods. For example, suppose a small company that manufactures power washers in South Dakota does not know or trust a small import company in South Korea. If the import company arranges a bankers' acceptance with Citibank to pay for the imports, the exporter can confidently ship the merchandise and not worry about whether or not they will get paid. Legally, both the issuer of the BA, Citibank in this example, and the company using it to make the purchase are obligated to pay at maturity. Maturities typically range from 30 to 270 days. Since there is some risk of default, BA rates are typically higher than T-bill rates. An additional benefit to the receiver of the acceptance is that there is a secondary market, albeit limited, for BAs. Thus, our power washer company does not necessarily need to wait until the BA matures, but can instead resell the instrument at a discount to meet its immediate liquidity needs. (You may want to flip back to Chapter 3, Exhibit 3–3 for a reminder of how bankers' acceptances work.)

Bankers' Acceptances (BAs)
Money market instruments created in the course of international trade to guarantee bank drafts due on a future date.

The Federal Reserve Act of 1913 authorized U.S. banks to participate in bankers' acceptances. The Fed provided stability and liquidity to this market by regularly buying BAs from 1914 to the 1930s and again after World War II until the 1970s. By the late 1970s the Fed was able to manage reserves by relying on Treasury securities alone and the acceptance market had matured enough to stand on its own. As a result, the Fed stopped outright purchases of BAs in 1977 and their use in repurchase agreements in 1984. From 1960s to 1984, bankers' acceptances experienced rapid growth—from $2 billion to $75 billion outstanding. However, the rise of asset-backed and Euro-commercial paper, as well as narrowing gaps between Eurodollar deposit rates and BA rates, have led to diminished use. By the end of 2008, the amount of outstanding bankers' acceptances had fallen to less than $.5 billion. We discuss them here only because of their historical significance.

Money Market Mutual Funds

Many money market instruments and markets date back centuries. However, until 1978 only large institutional investors were allowed to benefit from the relative safety and higher returns of these short-term debt securities. The large denominations involved were often far beyond what most individual investors were willing and able to spend on a single security. However, when the economic incentives are right, financial innovations can occur which fundamentally change the character of how financial participants and markets behave. In some cases they involve the creation of an entirely new type of intermediary. This is the case with money market mutual funds (MMMFs). MMMFs are short-term investment pools that use the proceeds they raise from selling shares to invest in commercial paper, U.S. government securities (Treasury and agency securities), municipal securities, repurchase agreements, small time and savings deposits, and other domestic and foreign short-term debt securities. The interest earned on these securities, minus a small management fee, is then paid to those investing in the fund.

MMMFs emerged in the late 1970s as an example of financial innovation outpacing financial regulation. In this case, economic conditions changed much faster than the structure of financial system regulation. FIs were forced to evolve or go bankrupt. In the late 1970s interest rates increased sharply and stayed above Regulation Q deposit interest rate ceilings. Initially only the largest depositors engaged in **disintermediation**—the process of pulling deposits out of intermediaries and directly purchasing financial instruments in the open market. However, investment banks and brokerage firms began offering MMMFs as an alternative to deposits. The funds paid market rates of interest and allowed check writing. They were not insured, so investors were exposed to only a bit more default risk. MMMFs use most of their funds to purchase high-quality, short-term commercial paper and government securities that have little risk of default. This new instrument caused a great many problems for depository institutions. Ordinary depositors with small balances could now withdraw their funds from depository institutions and reinvest them in MMMFs.[3] Eventually Congress passed legislation in the early 1980s to eliminate Regulation Q ceilings and authorized banks to offer money market deposit accounts and for savings associations to offer NOW accounts.

Disintermediation
The reversal of the financial intermediation process whereby funds are pulled from financial intermediaries, like banks, and moved directly into open market instruments like commercial paper or government securities.

With most MMMFs, investors are typically required to have a minimum initial investment of somewhere between $500 to several $1,000 to open an MMMF account. In some cases, if one is willing to have regular electronic payments set up from one's checking account, some companies will accept a lower initial investment. These features, as well as those noted before, have made MMMFs one of the fastest growing intermediaries of the 1980s and 1990s. Although there were almost no MMMFs in 1978, by mid--2008 they managed almost $3.5 trillion in assets.

Recap

Negotiable CDs are debt instruments issued by commercial banks. They typically have fixed interest rates, maturities of one to three months, and denominations of $1 million. Their most distinctive feature is that unlike non-negotiable CDs and time deposits, negotiable CDs may be resold before maturity. U.S. Treasury bills are regularly auctioned by the federal government to finance the national debt and to manage the mismatch between government revenues and expenditures. They are characterized by typical maturities of 13, 26, or 52 weeks; denominations as low as $100; an absence of default risk; high liquidity; and preferential tax treatment. Eurodollars are dollar-denominated deposit liabilities held anywhere outside of the U.S. system of banking regulation. Bankers' acceptances facilitate international trade by allowing a bank to guarantee the payments of its customers engaged in importing goods from abroad. They are historically significant but in recent years have fallen to miniscule amounts. Money market mutual funds pool the funds

of their shareholders and use them to purchase a variety of money market instruments. Their creation in the late 1970s brought the safety and high yields of the money market to individual investors.

We have covered a lot of territory in this chapter. You should now have a fuller understanding of money market instruments and markets as well as how various institutions and individuals make use of these instruments. As we have shown, the domestic money market has grown rapidly over the last couple of decades as financial innovations such as MMMFs emerged and corporations increased their reliance on commercial paper and reduced their use of bank loans. The money market has also become more global in scope. We have witnessed this trend with innovations such as the Eurodollar and other Euro-type deposits as well as the use of Euro and foreign CDs. As technological advances are made in telecommunications and computing, and as barriers to trade are eliminated, we expect these trends of continued growth, innovation, and global expansion of the money market to continue. We should also note that there may be additional changes in the structure and regulation of money markets as a result of the financial crisis of 2008.

In the next chapter, we turn our attention to corporate and government bond markets.

Summary of Major Points

1. Money market instruments share four common characteristics. They are (1) issued in large denominations, (2) have short maturities, (3) generally expose investors to low default and liquidity risk, and (4) do not have a common trading floor or location.
2. Many different institutions make use of the money market to manage the mismatch in the timing of their revenues and expenditures. These include commercial banks and savings associations, governments and government-sponsored enterprises (GSEs), the Federal Reserve, corporations and finance companies, pension funds and insurance companies, brokers and dealers, as well as money market mutual funds (MMMFs) and individuals.
3. Commercial banks and savings associations participate in the money market in five main ways. First, they borrow in the fed funds and repurchase agreement market when they need to meet their reserve requirements and issue CDs to raise funds. Second, depository institutions hold large quantities of federal government-issued Treasury bills to manage their revenues and expenditures. Third, large commercial banks assist other institutions in issuing commercial paper by providing fee-based credit enhancements. These include lines and letters of credit. Fourth, some large banks serve as agents and underwriters in the commercial paper market. Fifth, the largest banks and savings banks serve as primary dealers in the government securities market. This allows them to trade money market securities for their corporate customers.
4. Many different types of institutions play an active role in the money market. The federal government issues U.S. Treasury bills (T-bills) to finance some of its expenditures. The Fed uses these securities to manage the banking system's reserve level and interest rates. Government-sponsored enterprises issue commercial paper to fund expenses related to housing, agriculture, and student loans. State and local governments issue municipal notes to finance various expenditures, especially for educational purposes. Corporations and finance companies assist consumers in buying automobiles, boats, and real estate by issuing commercial paper and lending these funds to their customers. Pension funds, insurance companies, other businesses, and individuals use the money market and money market mutual funds for cash management purposes.
5. Brokers and dealers ensure the regular functioning of the money market by marketing new issues of securities, standing ready to purchase these

securities, and in some cases acting as intermediaries by borrowing from those desiring to lend, and lending to those who desire to borrow. Brokers do not take ownership positions; dealers do.

6. Commercial paper, federal funds, repurchase agreements and Treasury bills are the four most frequently used types of money market instruments. Their outstanding balances constitute more than one-half of all outstanding money market instrument balances.
7. Commercial paper refers to short-term (less than 270 days), large denomination, unsecured promissory notes issued by the most creditworthy corporations as an alternative to bank borrowing. Commercial paper is sold on a discount basis and is used to fund current transactions. It may be offered through brokers or as direct placements. The primary benefit to issuers is that issuing commercial paper is cheaper than borrowing from a bank. Most outstanding commercial paper has been issued by nonbank financial companies. However, other financial and nonfinancial companies make use of this market to meet short-term credit needs.
8. Depository institutions use fed funds and repurchase agreements to meet their reserve requirements. Fed funds consist primarily of overnight loans of reserves between banks. Repurchase agreements (repos) are short-term agreements in which a seller simultaneously agrees to sell government securities now and promises to buy them back in the future at a higher price. In effect, repurchase agreements look like collateralized loans secured with government securities. Reverse repurchase agreements or matched sale-purchase (MSP) agreements refer to the same transaction from the perspective of the lender of funds. Unlike fed funds, RPs are also be used by securities dealers, money market and mutual funds, pension funds, nonfinancial corporations, and state and local governments.
9. Commercial banks issue negotiable CDs with fixed interest rates, term maturities of one to three months, and denominations of $1 million. Their most distinctive feature is that unlike nonnegotiable CDs and time deposits, negotiable CDs may be resold before maturity. Euro CDs refer to CDs denominated in a currency other than that of the country in which they are issued. In contrast, foreign CDs are issued by a foreign bank in the domestic currency of the country in which they are issued.
10. The federal government regularly auctions U.S. Treasury bills (T-bills) through a uniform-price method to manage the mismatch between government revenues and expenditures. T-bills have typical maturities of 4, 13, 26, or 52 weeks, denominations as low as $100, an absence of default risk, high liquidity, and are given preferential tax treatment. Because of these various features, T-bills almost always have the lowest interest rate among money market instruments. Like commercial paper, they are sold on a discount basis.
11. To earn a higher rate of return than that on T-bills, investors often turn to the Eurodollar market. Eurodollars are dollar-denominated deposit liabilities held anywhere outside of the U.S. banking system. This includes the use of international banking facilities (IBFs) by foreigners residing in the United States. In London, larger banks express the rate at which they are willing to borrow Eurodollars as the London interbank bid rate (LIBID). The rate at which they are willing to lend Eurodollars is called the London interbank offered rate (LIBOR).
12. Bankers' acceptances (BAs) facilitate international trade by allowing a bank to guarantee the payments of its customers engaged in importing goods from abroad. They typically mature in 90 days and a limited resale market invests for those who wish to sell the instruments before they mature.
13. The most important innovation in the money market during the post–World War II era was the creation of money market mutual funds. MMMFs pool the funds of their shareholders and use these to purchase a variety of money market instruments. The interest earned on these securities, minus a small management fee, is then paid to those investing in the fund. Their creation in the late 1970s brought the safety, liquidity, and money market rates of interest to individual investors, while also providing access to their funds through limited check writing.

Key Terms

Backup Line of Credit, p. **242**
Bankers' Acceptances (BAs), p. **259**
Certificates of Deposit (CDs), p. **253**
Commercial Paper, p. **240**
Competitive Bid, p. **255**
Direct Placements, p. **248**
Disintermediation, p. **259**
Euro CDs, p. **254**
Eurodollars, p. **256**
Federal (Fed) Funds, p. **248**
Fed Funds Rate, p. **250**
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International Banking Facilities (IBFs), p. **257**
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London Interbank Bid Rate (LIBID), p. **259**
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Money Market, p. **240**
Money Market Mutual Funds (MMMFs), p. **240**
Multiple-Price Method, p. **256**
Negotiable Certificates of Deposit (CDs), p. **254**
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Repurchase Agreement, p. **250**
Reverse Repurchase Agreement or Matched Sale-Purchase (MSP) Agreement, p. **250**
Stop-Out Yield, p. **256**
Thrift CDs, p. **253**
U.S. Treasury Bills (T-bills), p. **255**
Uniform-Price Method, p. **256**

Review Questions

1. What are the four characteristics shared by almost all money market instruments?
2. Explain how the following participate in the money market:
   a. Commercial banks and savings associations
   b. Governments and government-sponsored enterprises (GSEs)
   c. The Federal Reserve
   d. Corporations and finance companies
   e. Pension funds and insurance companies
   f. Brokers and dealers
   g. Money market mutual funds and individuals
3. What specific role do brokers play in the federal funds market? (Hint: See the related Closer Look feature.)
4. When banks are short on reserves, why do they use the fed funds or repurchase agreement markets instead of borrowing from another bank?
5. What three sets of money market instruments have the largest outstanding dollar amounts? Which is the largest? Of all money market instruments, which has the smallest outstanding balance?
6. Why are commercial paper issues characterized by maturities of less than 270 days, large denomination amounts, and used exclusively for the purpose of funding current transactions?
7. What two places might a commercial bank turn to if it wants to borrow reserves in the fed funds market? How does the Fed influence the fed funds rate?
8. Explain the difference between a repurchase agreement and a reverse repurchase agreement. In what ways does the fed funds market differ from the repo market?
9. How do negotiable CDs differ from traditional demand deposits and from traditional time deposits?
10. In what ways does the history of negotiable CDs illustrate this text's dual themes of evolutionary change and globalization? (Be sure to mention the roles played by National City Bank, Penn Central Transportation Company, Regulation Q, and the rise of money market mutual funds, Euro CDs, and foreign CDs.)
11. Why are U.S. Treasury bills characterized by the lowest interest rate of any money market instrument? How do the currently used uniform-price method auctions differ from the previously used multiple-price method auctions? Why did the Treasury change auction methods?
12. When, where, why, and by whom were Eurodollars created? What advantages does a bank like JPMorgan Chase & Co. have in issuing a Eurodollar deposit instead of a domestic deposit?
13. How do bankers' acceptances (BAs) facilitate international trade? Is the Fed an active participant in this market?
14. Institutions develop to solve historically specific problems and then frequently persist long after that initial problem has been resolved. In what ways does this statement apply to the creation of

money market mutual funds and their continued growth? In what ways does the statement apply to the Eurodollar market and its continued growth?

15. Did money market mutual funds facilitate disintermediation in the late 1970s and early 1980s?

Analytical Questions

16. Assume there are excess reserves in the banking system. Explain why first the fed funds rate is likely to fall and then why the repurchase agreement rate is likely to follow. Can you speculate as to why other money market rates are likely to fall as well?
17. How much interest income would be generated on a $10 million, three-day repurchase agreement, given an RP rate of 6.0 percent?
18. How much interest income would be generated on a $5 million, five-day repurchase agreement, given an RP rate of 5.0 percent?
19. If one purchases an RP for $9,950,000 and sells it *five* days later for $10 million, what annualized rate of interest would be earned?
20. If one purchases an RP for $9,950,000 and sells it *ten* days later for $10 million, what annualized rate of interest would be earned?
21. Assume that you submitted a noncompetitive bid for a $10,000 U.S. Treasury bill. The bill matures in 13 weeks and the purchase price is $9,844.50. What is the auction price rate? What is the T-bill annualized yield?
22. Assume that you submitted a noncompetitive bid for a $10,000 U.S. Treasury bill. The bill matures in 26 weeks and the purchase price is $9,600. What is the auction price rate? What is the T-bill annualized yield?
23. Go to **www.bankrate.com/brm/rate/mmmf_home.asp** or and do a search on money market mutual fund rates in your city (or state if you live in a nonmetro area). Who offers the highest annual percentage rate in your area? What do they require for a minimum deposit?
24. Go to **www.treasurydirect.gov** and find under "Charts and Analysis," Principal/Interest graphs." Go to the "Debt Distribution." Of the total marketable securities outstanding, what share is in the form of Treasury bills?

Suggested Readings

For an interesting article about safety and liquidity in the money market given the subprime lending crisis, see Lauren Young, "Bernanke's New Entourage" in *BusinessWeek*, January 30, 2008.

To learn more about the direct purchase of Treasury securities go to The Bureau of the Public Debt home page at **www.publicdebt.treas.gov**.

The single best source for information about money market instruments and participants is the Federal Reserve Bank of Richmond's *Instruments of the Money Market*, 7th ed., edited by Timothy Q. Cook and Robert K. Laroche. It was last updated in 1993. As chapters are revised they become available online at **www.rich.frb.org/instruments/toc.html.** Marcia Stigum, *The Money Market*, rev. ed. (Homewood, Ill.: Dow Jones-Irwin, 1990); and First Boston Corporation, *Handbook of Securities of the United States Government and Federal Agencies, and Related Money Market Instruments* (July 1990) are also valuable reference materials.

From the Federal Reserve Bank of New York comes *U.S. Monetary Policy & Financial Markets* by Ann-Marie Meulendyke. Although primarily about monetary policy, Chapter 4 provides an overview of financial markets and includes an informative discussion of money market instruments. For current monthly data on money market interest rates and volumes of various instruments outstanding, consult *The Federal Reserve Bulletin.*

Endnotes

1. Although repos look like a collateralized loan, legally they have been treated as sales and repurchase contracts. Regardless of this legal ambiguity, in the case of bankruptcy, lenders can liquidate the securities in their possession.
2. The one exception to this is if the bidder happens to be the one bidder offering the highest discount rate (lowest price) bid. (This is called the stop-out yield.) In this case, he or she is awarded as many T-bills as needed so that the total amount of bids accepted for purchase equals the total amount of bills offered for sale.
3. Be sure you are clear that disintermediation means the removal of funds from FIs into open market instruments such as government securities, stocks, or bonds. When funds are removed from depository institutions and put into money market mutual funds, disintermediation has not occurred because money market mutual funds are intermediaries.

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CHAPTER TWELVE

12

"Gentlemen prefer bonds."

The Corporate and Government Bond Markets

Learning Objectives

After reading this chapter, you should know:

The characteristics of the bond market and how the market has changed in recent years

How corporate and government bond markets function

The characteristics and advantages of municipals

The role of government agency securities and government-sponsored enterprises in bond markets

The determination of bond prices and the factors that affect them

The types of international bonds

HISTORY IN THE MAKING

In Chapter 5, we saw that small changes in interest rates can cause large changes in bond prices. The longer the term to maturity, the greater the change in price for any change in the interest rate. In an era of volatile rates, price changes can be dramatic and bond markets can be anything but dull. In recent years, there have been other noteworthy trends in bond markets, illustrated by the following two scenarios. We are hopeful they will convince you to give this chapter close attention.

When the Fed increases short-term rates, long-term rates also tend to increase. However, this is not always the case. From mid-2004 to mid-2006, the Fed increased the fed funds rate 17 times from 1 percent to 5.25 percent. At the same time, long-term rates on corporate and Treasury bonds continued to fall or stay the same! Fed chairman Alan Greenspan stated, "For the moment, the broadly unanticipated behavior of world bond markets remains a conundrum."[1] Had risk premiums for owning bonds been reduced dramatically?

In late 2007 the extent of the subprime loan crisis in the housing market became apparent. The crisis began to spread from the mortgage and mortgage-backed securities markets to other asset-backed securities and to bond markets in general. The Fed lowered short-term interest rates significantly, taking the fed funds rates from 5.25 percent to 2 percent. Long-term rates on government bonds fell to a lesser extent. However, at the same time Treasuries rates were falling, corporate bond rates increased significantly, and the spread between corporate bonds and government securities of the same maturity widened tremendously. Note that government securities are considered to be default risk free. Clearly, the risk premium for holding corporate bonds had increased significantly because of the crisis, just as economic theory would predict. The widening spread was accompanied by declines in credit availability, decreases in liquidity, and increases in investor risk sensitivity.

The bond market is the market in which bonds issued by borrowers are bought by and sold to lenders. In this chapter we explore the government and corporate bond markets in order to gain insight into the scenarios above. What are the characteristics that all bonds have in common? What are the advantages and disadvantages of bonds to a firm and to investors? How does a firm go about designing an initial public offering of bonds? How do the federal government, government agencies, and government-sponsored enterprises go about marketing their securities? What is the international bond market? These are some of the questions that will be answered in this chapter.

Before we can discuss the characteristics of the corporate and government bond markets, we need to know what a bond is.

Coupon Rate
The fixed interest rate stated on the face of a bond.

Bearer Bonds
Bonds in which the bond's owner clips the coupon from the bond and sends it to the issuer, who then returns the coupon payment.

Registered Bonds
Bonds in which the issuer keeps records of ownership and automatically sends the coupon payment to the bondholder.

THE BOND MARKET

Bonds are debt instruments with an original maturity greater than 10 years that are issued by private and public entities. They normally pay a fixed interest rate, the **coupon rate,** which is stated on the face of the bond. The principal, also called the *par value* or face value of the bond, is repaid in full at maturity. The *coupon payments* (C) are equal to the coupon rate multiplied by the face value of the bond and are usually made every six months.

Historically, bonds were either bearer bonds or registered bonds. In the case of **bearer bonds,** the bond's owner clips the coupon from the bond and sends it to the issuer, who then returns the coupon payment. With **registered bonds,** the issuer keeps records of ownership and automatically sends the coupon payment to the bondholder. Today, registered bonds are far more prevalent than bearer bonds. The issuer may be the U.S. government, an agency of the government, a state or local government, a domestic or foreign corporation, or a foreign government.

12-1

The Spread Between Twenty-Year Municipal Bonds with Different Credit Ratings 1960–2008

Source: Global Financial Data, Los Angeles, California.

Three major credit-rating agencies, Standard & Poor's, Moody's Investors Service, and Fitch, analyze and evaluate bonds and assign them to a particular risk class based on the probability that the issuer will fail to pay back the principal and interest in full when due. The credit-rating agencies examine the pattern of revenues and costs experienced by a firm, its degree of leverage (dependence on borrowed funds), its past history of debt redemption, and the volatility of the industry, among other things. A firm with a history of strong earnings, low leverage, and prompt debt redemption would get an Aaa rating from Moody's and an AAA rating from Standard & Poor's. A firm that has experienced net losses, has rising leverage, or has missed some loan payments would get a Baa or lower rating from Moody and a BBB or lower rating from Standard & Poor's.

Moody's, Standards & Poor's, and Fitch also assign ratings to municipal securities issued by state and local governments. Important factors in determining the rating include the tax base, the level of outstanding debt, the current and expected budget situation, and the growth in spending. The specific rate classes of Standard & Poor's and Moody's were summarized in Exhibit 6–7 of Chapter 6.

Bond ratings are beneficial to lenders because they help the lender determine the risk involved in purchasing a specific bond. Bonds rated below investment grade are not recommended for investment and are often referred to as *high-yield* or *junk bonds*, depending on one's perspective. Of course, their high yield results from their riskiness. Exhibit 12–1 shows the spreads between yields on bonds with different credit ratings

since 1960. The lower the credit rating, the higher the interest rate investors require to purchase the bonds. Note also how the spread widened in the last few years due to the financial crisis and perceived increased riskiness of lower rated bonds.

The Corporate Bond Market

As the name implies, corporate bonds are issued by corporations. Investment bankers like Merrill Lynch, Bear Stearns, and Lehman Brothers have historically designed, marketed, and underwritten new corporate bond issues. Note that in the financial crisis of 2008, the five largest investment banks have either declared bankruptcy, changed their charter to bank holding companies, or been purchased by another financial institutions. For example, as we shall see in Chapter 21, Bear Stearns was purchased by JPMorgan, Lehman Brothers declared bankruptcy, Merrill Lynch was purchased by Bank of America, and both Goldman Sachs and Morgan Stanley changed their charters to bank holding companies. One of the advantages for an investment bank of converting to a bank holding company is direct access to borrowing from the Fed. Since investment banks had provided a critical financial service that involved the underwriting of newly issued primary securities and the associated risk taking, this function is in the process of ongoing change.

Bond Indenture
A document stating the terms under which a bond is issued.

The investment banker also designs the bond indenture. The **bond indenture** is a document that spells out the terms of the offering along with many other provisions under which the bonds are issued. The indenture is made out to a trustee who represents the investors buying the bonds. The trustee usually works for a bond or trust company, or may be part of the trust division of a bank. The trustee is an expert in interpreting the provisions of the offering for the investors and sees that the issuer fulfills the terms and conditions of the indenture.

The following are some of the provisions that an indenture may include:

Sinking Fund Provisions
Provisions of a bond indenture that specify whether the corporation is required to pay off a portion of the newly issued bonds each year.

1. *Sinking fund provisions:* A provision that specifies if the corporation is required to pay off (retire) a specified portion of the newly issued bonds each year is called a **sinking fund provision.** Sinking fund provisions increase the probability that all of the bonds will be paid back by maturity. For example, if a corporation issues 15-year bonds, a sinking fund provision may require that 1/15 of the issue be retired each year.

Call Provisions
Provisions of a bond indenture that specify whether the corporation can pay off the bonds before they mature (and if so, under what terms).

2. *Call provisions:* A provision that the corporation can pay off (retire) the bonds before maturity is called a **call provision.** Call provisions also state under what terms the bonds can be retired. A corporation may want to pay off bonds if the interest rate has fallen since the bonds were originally issued. The proceeds of a new bond issued at a lower interest rate could be used to redeem the higher-rate bonds. Another reason why a corporation may want to call bonds is to meet the sinking fund provisions just discussed. In either case, the bond indenture spells out the terms under which the bonds can be called. This includes the premium that will have to be paid above the face value of the bonds if they are retired; the premium may vary depending on the reason why the bonds are retired. Today, most corporate bonds are issued with call provisions.

Convertible Bonds
Bonds in which the bondholder has a right to convert the bonds to a predetermined number of shares of common stock; particularly beneficial to the bondholder if the shares of stock appreciate greatly.

3. *Convertibility provisions:* If the bondholder has a right to convert the bonds to a predetermined number of shares of common stock, the bonds are called **convertible bonds.** If the stock's price rises enough to make the conversion beneficial for the bondholder, this right will be exercised. The conversion will be beneficial if the stock's price rises such that the difference between the value of the predetermined number of shares of stock and the value of the bonds more than compensates for the increase in the risk of owning stocks rather than bonds. In most cases, the stock's appreciation would have to be significant for the conversion to be beneficial and thus exercised. However, convertibility provisions have value and, generally, convertible bonds will be issued at lower interest rates than bonds without this feature.

Warrant
Contracts sometimes issued with newly issued bonds; warrants give the holder the right to purchase a designated security at a price set today; warrants may be sold to a third party.

Restrictive Covenants
Stipulations within the bond indenture that limit the ability of the corporation with regards to certain activities.

4. *Provisions for the issuance of warrants:* A **warrant** is a contract that gives the holder the right to purchase a designated security such as common stock or bonds of the issuer any time up to a future date at a price set today. If bonds are issued with a warrant, the bond indenture will include provisions about the warrants. Warrants may be held to be used at a later date, or they may be sold immediately to a third party. Bonds issued with warrants are issued at lower interest rates than bonds without this feature.
5. *Restrictive covenants:* **Restrictive covenants** are stipulations within the bond indenture that limit the ability of the corporation with regard to certain activities. For example, restrictive covenants may restrict the salary and bonuses of the corporate officers, the amount of dividends the corporation can pay, or the amount of additional debt that can be incurred. Usually, the more restrictive the covenants, the lower the interest rate will be on the bonds.
6. The indenture may contain a provision that the coupon payment on the bond be increased if the credit rating of the corporation is downgraded by a certain amount during the life of the bond.

Some bonds are backed by specific collateral such as real or personal property. The collateral may include plant, equipment, and financial assets that the issuing corporation owns. **Mortgage bonds** are backed by real property while **collateral bonds** are backed by financial assets. **Debenture bonds** are not backed by specific collateral, but in the event of a default, they have a general claim on the otherwise unpledged assets of the issuer. Finally, **subordinated debenture bonds** are not backed by collateral and have a general claim after debenture bondholders have been paid. Thus, in the event of a default, owners of subordinated debenture bonds are the last bondholders in line to receive any funds after all other bondholders—and often after other creditors—have been paid. As expected, other factors being equal, subordinated debenture bonds pay the highest return, followed by debenture bonds, followed by mortgage and collateral bonds.

Mortgage Bonds
Bonds backed by real personal property.

Collateral Bonds
Bonds backed by financial assets.

Debenture Bonds
Bonds with no specific collateral backing but having a general claim on the other unpledged assets of the issuer.

Subordinated Debenture Bonds
Bonds with no collateral backing that have a general claim after debenture bondholders have been paid.

Some bonds also come with financial guarantees issued by insurance companies. The bond issuer pays a premium that guarantees the payment of interest and principal by the insurance company in the event the issuer defaults. In reality, the credit of the guarantor is substituted for the guarantee of the issuer. The issuer pays a premium for the financial guarantee. Because of the guarantee, the bonds are issued at a lower interest rate. Obviously, it is beneficial to the bond issuer to pay for the financial guarantee if the present value of the interest savings over the life of the bond is greater than the insurance premium.

Some firms also issue **zero-coupon bonds,** which, as their name implies, do not have coupons and do not make coupon payments. Instead, the bonds are sold at a discount with the difference between the amount paid for the bond and the amount received at maturity being equal to the interest.[2] The advantage to the investor is that there is no risk that the interest will have to be reinvested at a lower rate. A disadvantage is that the interest payments are amortized over the life of the loan and taxes are paid on the amount of the interest earned each year, even though the interest is not paid until the bond matures. The advantages for the corporation are that the interest payments are written off on an annual basis, and they do not have to be made until the bond matures.

Zero-Coupon Bonds
Corporate bonds sold at a discount with the difference between the amount paid for the bond and the amount received at maturity equal to the interest.

The secondary market in corporate bonds is a loosely connected array of brokers and dealers who buy, sell, and take positions in bonds in what is called the *over-the-counter market*. In the over-the-counter market, brokers and dealers buy and sell bonds over computer links and telephone lines. Although the bulk of bond trading takes place over the counter, some bonds are also bought and sold on organized exchanges such as the New York Stock Exchange.[3]

Looking Back

The Junk Bond Market

In 1909, John Moody issued the first public rating for bonds considered "too risky for investment" and called that rating "below investment grade."[a] These bonds are now called *junk bonds.* During the Great Depression of the 1930s, many bonds originally recommended for investment were downgraded to "below investment grade." After the bonds had been issued, their ratings were lowered because the issuing corporations were not doing as well as expected. At the end of the Great Depression, 42 percent of all outstanding corporate bonds were rated as junk bonds. Even so, new issues of junk were nonexistent because widespread financial failures—the brute forces of events—had caused investors to grow weary of all but the top-rated grades. As a result, by 1977, only 3.7 percent of outstanding corporate debt carried the below investment grade rating.

The market was ripe for change in the 1970s, when Michael Milken joined the small unknown brokerage house of Drexel Burnham Lambert. Under Milken's leadership, Drexel Burnham Lambert became a market maker for junk bonds. Drexel began underwriting new issues of junk bonds and created a secondary market, standing ready to buy or sell as needed. The junk bond market grew rapidly throughout the 1980s as financial intermediaries and individuals jumped on the bandwagon. By the end of 1989, more than 22 percent of outstanding U.S. corporate bonds were junk bonds. Furthermore, three-quarters of this debt had been issued below investment grade, and Drexel Burnham Lambert had grown to rival the largest investment banking firms on Wall Street. But the junk bond market was headed for trouble, and two events would lead to its demise.

First, a large issuer of junk bonds, Campeau Corporation, defaulted, causing panic and large sell-offs among junk bondholders. And second, Congress enacted a law forcing all U.S. thrift institutions—savings and loans, credit unions, and mutual savings banks—to sell off their junk bond holdings by mid-1994.

Faced with these events, the market collapsed and Drexel Burnham Lambert declared bankruptcy. A liquidity crisis ensued and prices plummeted further. Milken, who was indicted on 98 counts of racketeering and tax and securities fraud, pleaded guilty to 6 charges. His sentence included a $600 million fine and 10 years in prison. He ended up serving a much shorter time.

Many who rode out the declining market eventually did well. For instance, MCI, the long-distance phone company, got started by issuing junk bonds to finance its operations, and the market is active today.

When marketing these bonds, brokers refer to them as high-yield bonds.

Bonds trade with varying degrees of liquidity in the secondary market. Other factors being equal, the greater the expected liquidity, the lower the yield. Now would be a good time to read the "Cracking the Code" box on page 273, which tells how to understand corporate bond prices and yields as reported in the financial pages of popular newspapers. As of June 30, 2009, corporate bonds amounted to over $11.6 trillion and were the largest debt instruments outside of mortgages.

Corporate Bonds

The following table is a typical example of the way bond market information appears on *The Wall Street Journal Online*. The *WSJ* online edition provides reports of the most actively traded bonds on the New York Exchange. To view the most active investment-graded bonds, the most active high-yield bonds, and the most active convertible bonds for free, go to **www.wsj.com** and click on Markets Data Center, then select Bonds, Rates & Credit Markets. To understand the information provided, let us take a look at General Electric Capital Corp., one of the most active investment grade bonds as of November 2007. We will focus on the first bond in **bold** type.

New York Exchange

First, in column 1, you see the issuing company's name—General Electric Capital Corp (GE). Next to the name is the symbol GE.HDM and the coupon rate, or yield, 5.625 percent. It appears on the face of the bond and indicates the amount of interest that GE will pay the holder annually; in this case, the 5.625 percent indicates that $56.25 of interest will be paid annually (usually in semiannual installments) per $1,000 of face (or par) value of bonds held. The $56.25 is 5.625 percent of $1,000. Next is the maturity date, September 2017. At that time, GE will give the holder of the bond the last interest payment and $1,000 of principal per $1,000 of face (or par) value. As the name suggests, the face value appears on the face of the bond.

Next, we will look at the investment ratings provided by Moody's, S&P, and Fitch. General Electric has a triple A rating from Moody's, meaning that the company has a history of strong earnings, low leverage, and prompt debt redemption. (Note that the ratings from S&P and Fitch are not provided for GE.) The Weekly High, Low, Last, and Net Change in columns 6–9 refer to the price of the bond during the week from November 4, 2007 through November 9, 2007. The last column, "Yield %," presents the effective return on both coupon payments and principle if this bond were held until maturity in September 2017.

Note the price code in the bond market is different from the price code in the stock market. Bond prices are stated as percentages of 100, with 100 representing $1,000 face value. Hence, the closing price for the day

Issuer Name	Symbol	Coupon	Maturity	Rating.Moody's/ S&P/ Fitch	High	Low	Last	Change	Yield %
GENERAL ELECTRIC CAPITAL CORP	**GE.HDM**	**5.625%**	**Sep 2017**	**Aaa/—/—**	**104.084**	**98.241**	**102.084**	**0.596**	**5.349**
DEUTSCHE TELEKOM INTL FINANCE BV	HT.HA	5.750%	Mar 2016	A3/A–/A–	100.717	100.209	100.508	–0.934	5.672
LEHMAN BROTHERS HLDS	LEH.JAD	6.200%	Sep 2014	A1/—/AA–	102.765	95.620	95.620	–2.180	7.013
BEAR STEARNS & CO	BSC.GPS	6.400%	Oct 2017	A1/—/A+	98.131	94.335	95.163	–2.028	7.088
TIME WARNER	AOL.HL	6.500%	Nov 2036	Baa2/BBB+/BBB	95.736	94.915	95.266	–0.433	6.879
TIME WARNER	AOL.HK	5.875%	Nov 2016	Baa2/BBB+/BBB	100.331	97.683	100.331	2.137	5.827
INTL BUSINESS MACHINES CORP	IBM.KG	5.700%	Sep 2017	A1/A+/A+	102.610	102.066	102.610	0.300	5.354
CITIGROUP	C.HFD	5.875%	May 2037	Aa2/—/AA	90.875	89.359	90.875	1.058	6.579
KOHL'S CORP	KSS.GH	6.250%	Dec 2017	Baa1/BBB+/BBB+	100.125	99.519	99.999	–0.335	6.245
PROCTER & GAMBLE	PG.GY	4.950%	Aug 2014	Aa3/AA–/—	100.677	99.534	99.788	0.198	4.986

Source: The Wall Street Journal Online (November 12, 2007).

was 102.084, which means $1020.84. The weekly high was 104.084, which means $1040.84, and the weekly low was 98.241, which means $982.41. The closing price (102.084) was up .596 from the previous week's closing price. Thus, the previous week's closing price was 101.488, which means $1014.88. Therefore, the price of the bond has increased $5.96 during the past week.

Not so simple is the "Yield %" in the final column. In the past, financial publications reported the "current yield," which is simply the yearly coupon payment divided by the current price. For the General Electric bond we are considering, this would simply be 5.625/102.084 = 5.51 percent. This figure is not reported and is higher than the reported yield of 5.349 percent, because the bond is selling at a premium (since 102.084>100). Although the bond now costs $1020.84, in September 2017, only the $1,000 face value will be paid along with the final interest payment. Thus, the yield to maturity (Yield % reported) is smaller than the current yield (not reported). The opposite would be true for a bond selling at a discount. For example, consider the Lehman Brothers Holdings bond LEH.JAD. Its yield to maturity is reported as 7.013 percent, but its current yield would be 6.2/95.620 = 6.484 percent.

If a bond such as GE.HDM is selling at a premium, this implies interest rates have fallen since the bond was first issued. If a bond such as LEH.JAD is selling at a discount, this implies interest rates have risen since the bond was first issued. Only if a bond is selling at 100, or at par value, will the coupon yield be equal to the current yield.

Recap Bonds are debt instruments that may be issued by domestic or foreign governments and corporations. The terms of a corporate bond issue are spelled out by the bond indenture and interpreted by the trustee. These may include sinking fund provisions, call provisions, convertibility privileges, and other restrictive covenants. Corporate bonds may be mortgage bonds, collateral bonds, debenture bonds, or subordinated debenture bonds. Mortgage and collateral bonds are backed by real or financial assets that the corporation owns. Debenture bondholders are entitled to be paid before subordinated debenture bondholders. With convertible bonds, the bondholder can convert the bonds into a predetermined number of shares of stock. Bonds sometimes come with warrants that allow the bondholder to purchase (or sell the right to purchase to another investor) a number of shares of stocks or bonds in the future.

The Treasury Bond Market

As we saw in Chapter 3, government securities consist of Treasury bills, notes, and bonds, depending on maturity. Bills have an original maturity of one year or less. Notes have an original maturity of 2 to 10 years and bonds have an original maturity of greater than 10 years. For simplicity, we consider any government security with a maturity greater than a year to be a government bond. As of June 30, 2009, the outstanding amount of Treasury securities was about $7.2 trillion, of which $5.2 trillion were bonds.

U.S. government bonds, or Treasury bonds, are issued in the primary market by the Bureau of the Public Debt in minimum amounts of $100. They make periodic coupon payments (usually every six months). The Federal Reserve system sells Treasury securities in regularly scheduled competitive auctions. Treasury notes and T-bills are auctioned more frequently than bonds. The Treasury decides the maturity structure and the amount of the various offerings and announces it in advance to the public. Now would be a good time to read the accompanying "Closer Look" that discusses the schedule of Treasury auctions in late 2008 and early 2009.

The secondary market in Treasury bonds is an over-the-counter market. A group of U.S. government securities dealers stands ready to buy or sell various issues of outstanding securities over-the-counter. Today, Treasury securities are sold in worldwide secondary markets 24 hours a day. An extensive and very active secondary market

The Treasury Auction Schedule

By clicking on the Auction Schedules from the following Web site, one can pull up the Tentative Auction Schedule reproduced below for the upcoming period starting in November 2008 through December 2009. The Treasury updates the schedule approximately every three months for the six months going forward.

Tentative Auction Schedule of U.S. Treasury Securities

Security Type		Announcement Date	Auction Date	Settlement Date
3-year note		**Wednesday, November 5, 2008**	**Monday, November 10, 2008**	**Monday, November 17, 2008**
10-year note		**Wednesday, November 5, 2008**	**Wednesday, November 12, 2008**	**Monday, November 17, 2008**
30-year bond	R	**Wednesday, November 5, 2008**	**Thursday, November 13, 2008**	**Monday, November 17, 2008**
13- & 26-week bill		Thursday, November 6, 2008	Monday, November 10, 2008	Thursday, November 13, 2008
4-week bill		Monday, November 10, 2008	Wednesday, November 12, 2008	Thursday, November 13, 2008
Holiday—Tuesday, November 11, 2008—Veterans' Day				
13- & 26-week bill		Thursday, November 13, 2008	Monday, November 17, 2008	Thursday, November 20, 2008
52-week bill		Thursday, November 13, 2008	Tuesday, November 18, 2008	Thursday, November 20, 2008
4-week bill		Monday, November 17, 2008	Tuesday, November 18, 2008	Thursday, November 20, 2008
13- & 26-week bill		Thursday, November 20, 2008	Monday, November 24, 2008	Friday, November 28, 2008
2-year note		**Thursday, November 20, 2008**	**Monday, November 24, 2008**	**Monday, December 1, 2008**
5-year note		**Thursday, November 20, 2008**	**Tuesday, November 25, 2008**	**Monday, December 1, 2008**

R—denotes reopening
For additional information regarding Treasury auction announcements and results please see Web address: www.treasurydirect.gov/instit/annceresult/press/press_secannpr.htm.

By looking at the table, one can see that approximately one time per week, the Treasury will auction 13- and 26-week T-bills. These auctions are announced on Thursday, the auction date is Monday, and the settlement date is the following Monday. Likewise, on every Monday, auctions are announced for 4-week bills, with the auction date on the following Wednesday, and the settlement date one day later on Thursday. In addition, there are 7 auctions of 52-week bills, with the announcement on a Thursday, the auction the following Tuesday, and settlement two days later on Thursday.

Longer-term notes and bonds are auctioned less frequently—with the longer the term, generally, the less frequent. For example, in the 6-month period, there are only 3 auctions for 30-year bonds, 1 auction of 20-year TIPs, 7 auctions of 10-year notes, 2 auctions of 10-year TIPs, 6 auctions of 5 year notes, 1 auction of 5 year TIPs, 7 auctions of 3 year notes, and 6 auctions of 2-year notes.

Source: www.treas.gov/offices/domestic-finance/debt-management/auctions.

makes Treasury bonds highly liquid. The dealers' profits stem from the spread between the bid (buying) and ask (selling) prices.

How the Treasury Bond Market Works

Primary Dealers
The large banks and government securities dealers that are approved by the Fed to be the main participants in the auctions of Treasury securities that are conducted by the Fed. They also participate in open market operations with the New York Fed.

Primary dealers are large banks and securities brokers and dealers that trade Treasury securities directly with the New York Fed and are the main participants in the Treasury auctions. They submit competitive bids, which are offers to buy the newly issued bonds that may or may not be accepted. The role of primary dealers began in 1960 when 18 were selected. By 1988, the number of primary dealers had grown to 46. Since that time, the number has fallen to 17, primarily due to mergers among the firms within the banking and securities industries. The drop in the number of primary dealers has been more pronounced in the financial crisis of 2008 due to the merger or failure of several large firms that were primary dealers. Other financial institutions that are not primary dealers may also participate directly in Treasury auctions but need to fill out and submit the proper paperwork and abide by the auction rules.

To become a primary dealer, the firm must apply to the New York Fed and must demonstrate that it meets certain criteria. Banks must be in compliance with specific mandated capital standards. Brokers and dealers must have at least $50 million in regulatory capital and must meet other criteria established by the Securities and Exchange Commission. Foreign-owned firms that meet the criteria are eligible to become primary dealers.

Sales of government securities by the Treasury occur through a competitive bidding process in which the New York Fed asks all primary dealers and other registered bidders to submit bids in response to an announced offering. The lowest-priced bids are accepted up to the amount of the offering.

12–2
Who Are the Primary Dealers? Primary Dealers as of January 1, 2009

Following is a list of the 17 primary dealers that buy and sell securities directly with the Fed in the execution of monetary policy. In recent years, the number of primary dealers has fallen due to mergers or failures among large financial institutions.

BNP Paribas Securities Corp.
Banc of America Securities LLC
Barclays Capital Inc.
Canton Fitzgerald & Co.
Citigroup Global Markets Inc.
Credit Suisse Securities (USA) LLC
Daiwa Securities America Inc.
Deutsche Bank Securities Inc.
Dresdner Kleinwort Wasserstein Securities LLC.
Goldman, Sachs & Co.
Greenwich Capital Markets, Inc.
HSBC Securities (USA) Inc.
J.P. Morgan Securities, Inc.
Merrill Lynch Government Securities Inc.
Mizuho Securities USA Inc.
Morgan Stanley & Co. Incorporated
UBS Securities LLC.

Source: Federal Reserve Bank of New York, www.newyorkfed.org/markets/pridealers_listing.html.

In addition to participating in the auction of Treasury securities, primary dealers must participate in the Fed open market operations that are a part of monetary policy. The open market operations implemented under the direction of the Fed Open Market Committee (FOMC) involve both the selling and buying of Treasury securities. Thus, primary dealers play an important role in facilitating the implementation of monetary policy as well as the marketing of new Treasury securities.

Since 1994, bids to buy and offers to sell securities have been submitted electronically. Likewise, the Fed's responses to those bids and offers are also executed electronically. Primary dealers must participate in a meaningful way in the open market operations and the auctions, in terms of both size and competitiveness of their positions. They must also provide the Fed with weekly reports on their trading. Failure to do so may cause the Fed to withdraw their status as primary dealers. Exhibit 12–2 is a list of 17 primary dealers as of January 1, 2009.

Individual investors seeking to participate in the Treasury auctions may submit noncompetitive bids. With a noncompetitive bid, the investor agrees to accept the average rate determined at the auction and is guaranteed a security. If investors are planning to keep their securities until maturity, they may purchase the securities "Treasury direct" at the Bureau of the Public Debt or at a Federal Reserve bank or branch.

In addition to the Treasury direct system, the Federal Reserve also operates a commercial book-entry system. Ownership is recorded and payments are disbursed electronically. Investors who maintain their securities in this system have bought them through a financial institution or a government securities dealer, and the securities may be resold in the secondary market.

Treasury bonds are a full-faith and credit obligation of the U.S. government. Consequently, investors view Treasury securities as being free from default risk. The federal government, with its power to tax or issue currency, will definitely pay back the principal and interest as scheduled. However, Treasury bonds are not free of interest rate risk. If the interest rate goes up after the bonds are issued and before their maturity, the value of the bonds will go down. If the bonds are sold before maturity, the investor will receive less than the face value of the bonds and experience a capital loss. A desirable feature of Treasury bonds is that the interest earned is exempt from state income taxes; this feature is particularly beneficial in states with high income tax rates. Interest rates on Treasury securities serve as benchmark rates to judge the riskiness and liquidity of other securities, and their

Cracking the Code

Treasury Bonds

To understand how to read the accompanying table of developments that occurred in the government bond market on October 19, 2007 (taken from *The Wall Street Journal*), look at the highlighted line below. Under Rate (the first column) is 4.250. This is the coupon rate, and it indicates that the holder of this security receives $4.25 per year for each $100 (face or par value), usually paid in semiannual installments.

Maturity			Ask		
Rate	Mo/Yr	Bid	Asked	Chg	Yld
4.250	**Nov 15 2012**	**100:15**	**100:16**	**+1**	**3.08**

Source: *Wall Street Journal* (October 18, 2007).

The maturity date (second column) is Nov 15 2012. This simply indicates that the security will mature in November of the year 2012.

The next two columns give the Bid and Asked prices. The bid price is the price the market maker (dealer) is willing to pay to acquire this security. Prices are quoted in 32nds. Thus, 100:15 bid means 100 15/32, or $100.4688 per each $100. Hence, for a $1,000 bond, you need only to move the decimal point to find that the bid price is $1,004.688. The asked price is the price the dealer is asking when selling the security. In this case, the asked price is 100:16, which means 100 16/32, or $100.5 per $100. For a $1,000 bond, the asked price is $1,005.

The column Chg shows that the bid for this particular government security increased 1 on October 17, 2007, as compared with the close on the previous trading day. The change is also reported in 32nds, so the increase is really 1/32, or $0.03125 per $100, or $0.31 for a $1,000 dollar bond.

The last column gives the *yield to maturity* on an annual basis for this bond. It is 3.08 percent, which is the interest rate, or rate of return, on the bond. The yield to maturity takes into account the dollar return to the investor resulting from the coupon payment ($100 per year per $1,000 face value), the price appreciation or the depreciation between when the security is bought and when it matures, and the price paid.

In this case, there will be a depreciation at maturity; the security is selling at a premium: the market price of $1,005 exceeds the face value of $1,000.

Whenever the security sells at a premium, the yield to maturity is less than the coupon rate. Can you explain why the yield to maturity exceeds the coupon rate when the security sells at a discount (meaning the market price is less than the face value)?

prices are widely quoted in the popular media. The "Cracking the Code" feature on p. 284 explains how to interpret the prices of Treasury bonds reported in major newspapers.

Treasury STRIPS
A type of government security that allows investors to register and trade ownership of the interest (coupon) payments and the principal separately.

Treasury STRIPS (separate trading of registered interest and principle securities) are a type of government security first offered in 1984 and sold through depository institutions and government securities dealers. All newly issued Treasury notes and bonds with maturities of 10 years or longer are eligible for the STRIPS program. STRIPS allow investors to register and trade ownership of the interest (coupon) payments and the principal amount of the security. The advantage of STRIPS is that the coupon and principal payments can be sold separately at a discount. Don't let these last statements fool you into thinking that there are actual physical securities and actual physical coupons. STRIPS are sold in book entry form, meaning that the security is issued and accounted for electronically. The investor pays less today for the future payment than he or she will receive when the security matures. The interest the investor earns is the difference between what is paid today and what is received at maturity. Because the future payments are sold at a discount, the investor avoids the uncertainty that coupon payments may have to be reinvested at a lower interest rate because rates have fallen since the security was issued. The future payments of the STRIPS securities are direct obligations of the U.S. government.[4]

The International Bond Markets

As financial markets become globalized, the international bond market plays an increasingly important role in the domestic bond market by augmenting the supply of funds available and by increasing the array of bonds available to investors. The international bond market consists of primary and secondary markets for Eurobonds and foreign bonds.

Eurobonds

Eurobonds are bonds denominated in a currency other than that of the country where they are marketed. For example, dollar-denominated bonds sold outside the United States are called Eurobonds. Like the term Eurodollar, Eurobond has come to mean any bond denominated in the currency of the country from which it was issued rather than that of the country where it is sold. The Eurobond market experienced tremendous growth in the 1980s and early 1990s and now accounts for over 80 percent of new issues in the international bond market. In addition, the value of dollar-denominated Eurobonds exceeds the value of new issues in the domestic corporate bond market. No longer do domestic borrowers have to look only to domestic lenders or domestic financial intermediaries to obtain funds. Likewise, domestic lenders have opportunities to supply funds denominated in dollars outside the United States. The Eurobond market has greatly expanded the borrowing sources for domestic borrowers. In addition, Eurobonds are less regulated than domestic bonds and offer some tax advantages.

Up to 1984, foreign purchasers of U.S. bonds were subject to a 30 percent withholding tax on all interest payments. Because of this, many Eurobonds were issued through subsidiaries of U.S. corporations in Netherlands Antilles. This location was chosen because of a treaty between the United States and Netherlands Antilles that made non-U.S. investors exempt from the withholding tax. This effectively sidestepped the tax and allowed the bonds to be offered at a lower rate. But to issue Eurobonds, corporations had to have or establish a financial subsidiary in Netherlands Antilles. This was too costly for many firms. In July 1984, the U.S. government repealed the withholding tax and authorized U.S. corporations to sell bonds directly to non-U.S. investors without the withholding tax. This greatly increased the volume of bonds sold directly to non-U.S. investors.

Foreign Bonds

Unlike Eurobonds, foreign bonds are denominated in the currency of the country where they are underwritten and sold to investors, although the issuer of the bonds is from a foreign country. An example is a bond issued by a French corporation, denominated in dollars (as opposed to French francs), and marketed in the United States by U.S. investment bankers. Foreign bonds denominated in dollars and marketed in the United

States are called *Yankee bonds,* foreign bonds denominated in Japanese yen and sold in Japan are called *Samurai bonds,* and foreign bonds denominated in British pound sterling and sold in Great Britain are called *Bulldogs.* In order to finance their overseas operations, domestic corporations often issue foreign bonds in the countries where those operations are located.

Treasury Inflation-Protected Securities (TIPS)
Bonds whose principal amount is adjusted for inflation or deflation at the time when coupon payments are made (usually every six months).

Treasury Inflation-Protected Securities (TIPS) are a more recent hybrid, first offered for sale by the Treasury in January 1997. TIPS are an inflation-indexed bond in which the principal amount is adjusted for inflation or deflation, as measured by the consumer price index, at the time when an interest (coupon) payment is made, usually every six months. Although the interest rate does not change, the interest payments are based on the inflation- or deflation-adjusted principal, and the inflation-adjusted principal is repaid at maturity. In the case where there has been deflation over the term of the security, the original principal is repaid. Inflation-indexed bonds protect the investor from the ravages of inflation.

I Savings Bonds (I-Bonds)
Savings bonds whose interest rate is adjusted for changes in inflation.

The Treasury also sells **I Savings Bonds (I-Bonds)** as a vehicle for small investors to protect the purchasing power or real value of the investment. The bonds are sold at face values of $50, $75, $100, $200, $500, $1,000, $5,000, and $10,000. They earn an inflation-indexed return, tied to the consumer price index, every 6 months for up to 30 years. The interest earnings are added to the bond principal every month and accumulate until the bond is cashed in, with any tax liabilities being due at that time. If the I-Bond is redeemed in less than 5 years, there is a penalty of the most recent 3 months of interest. Individuals can purchase a minimum of $5,000 in a calendar year. A couple can purchase up to $10,000.

Recap

Treasury securities are sold in competitive auctions with participation by 17 approved primary dealers and other registered financial institutions. They can also be purchased by individuals through Treasury direct or from a financial institution or government securities dealer. They are considered to be free of default risk, and their interest rate serves as a benchmark to judge the risk and liquidity of other financial assets. The secondary market for government securities is a highly developed, over-the-counter market. STRIPS are a government security that allow the investor to register and trade ownership of the coupon payments and the principal separately. Because the future payments are sold at a discount, the risk (called reinvestment risk) that coupon payments may have to be reinvested at a lower interest rate is eliminated. The principal of inflation-indexed bonds is adjusted for inflation every six months. The coupon payment is based on the inflation-adjusted amount and the investor receives the inflation-adjusted principal at maturity. I Savings Bonds offer small investors savings bonds where the interest rate is tied to changes in the consumer price index.

MUNICIPAL AND GOVERNMENT AGENCY SECURITIES

Municipal Bonds (munis, for short)
Bonds issued by state, county, and local governments to finance public projects such as schools, utilities, roads, and transportation ventures; the interest on municipal securities is exempt from federal and state taxes for investors living in the issuing state.

Municipal bonds (munis, for short) are bonds issued by state, county, and local governments to finance public projects such as schools, utilities, roads, and transportation ventures. The interest on municipal securities is exempt from federal taxes as well as from state

taxes for investors living in the issuing state. This allows the issuer to borrow at a lower rate than if taxes would have to be paid on the interest earned. Municipal bonds are particularly attractive to taxpayers in high income tax brackets. As we saw in Chapter 3, the interest rate will gravitate to the rate at which the average investor is indifferent between purchasing munis or other bonds of comparable maturity, liquidity, and risk where the interest income is not tax exempt. This rate is depicted in Equation 12–1, where t is the average marginal tax rate, i_b is the rate on comparable bonds, and im is the rate on munis.[5]

$$i_b(1 - t) = i_m \tag{12–1}$$

Taxpayers in a tax bracket higher than the average marginal bracket can earn a higher return by investing in munis. The cost to the state, county, or local government issuer is t percent less than it would be if the interest income were not tax exempt. Thus, if the comparable corporate rate is 8 percent, the average marginal tax bracket 25 percent, and the muni rate 6 percent, taxpayers in a tax bracket above 25 percent can earn a higher after-tax return by investing in munis. In addition, municipalities can borrow at a rate 2 percent lower than if their interest income were not tax exempt.

Municipal bonds may be either *general obligation bonds* or *revenue bonds.* General obligation bonds are repaid out of general tax revenues. A default in the state-issued municipal bonds market has not occurred in the last 100 years. This is not true for munis issued by local and county governments. Repayment of revenue bonds is tied to the success of a specific project that the bonds support. That is, the bondholder is paid back out of the cash flows of a particular project. Defaults on revenue bonds occurred when specific projects did not generate the forecasted revenues.

Most municipal bonds are marketed publicly in the primary market through an investment banker and/or the municipal bond department of a commercial bank. Some issues may also be placed privately. An official statement, a legal opinion that describes the offering, must be released with each new offering. As noted earlier, municipal bonds are rated by Moody's and Standard & Poor's. Governments often try to time their issuance of "munis" when interest rates are low. Although secondary markets are active, they do not have the breadth and depth of secondary markets for Treasury securities.

As previously mentioned, muni bonds are more likely to be backed by a bond insurer than corporate bonds, with roughly half of such issues so insured. In early 2008 bond insurers such as Ambac, MBIA, Assured Guaranty, and FSA were receiving a great deal of scrutiny. Such insurers were previously believed to have effectively reduced default risk of municipal bonds. They insured bonds issued across many different states and it seemed unlikely that many such issuers would default simultaneously. Thus the insurers earned the highest "triple-A" ratings, which then applied to the bonds they insured. Some insurers, specifically Ambac and MBIA, moved away from their specialty in government bonds and began to insure more risky bond-type securities backed by residential mortgages during the real estate boom years, 2002–2006. Falling real estate prices after 2006 increased the likelihood of default on such assets and threatened the insurers themselves. If the credit rating of a bond insurer were reduced, this would affect all the bonds they had previously insured, increasing the interest rate that such borrowers would be required to pay. As of early 2008 government agencies from New York and the United States were actively assisting bond insurers to retain their "triple-A" credit ratings.

Government Agency Securities
Bonds issued by private enterprises that were publicly chartered by Congress to reduce the cost of borrowing to certain sectors of the economy such as farming, housing, and student loans.

Government-Sponsored Enterprises
Private enterprises that have been chartered by Congress to reduce the cost of borrowing in such sectors as housing, farming, the savings and loan industry, and student loans.

Government agency securities are issued by private enterprises that were publicly chartered by Congress to reduce the cost of borrowing to certain sectors of the economy. They can be divided into two classes: government-sponsored enterprises and federally related institutions securities markets.

Areas where **government-sponsored enterprises (GSEs)** have been established include housing, farming, and student loans. Among others, GSEs include the Federal

National Mortgage Association (Fannie Mae), the Federal Home Loan Mortgage Corporation (Freddie Mac), the Farm Credit System, and the Student Loan Marketing Association (Sallie Mae). All are privately owned and issue long-term securities (bonds) to assist in some aspect of lending such as funding of student loans, mortgage loans, and farm credit. In most cases, the federal government has no legal obligation to guarantee the timely payment of interest and principal. However, many market participants assume that the government does "de facto" guarantee the payments. This proved to be true in 2008, when the federal government put both Fannie Mae and Freddie Mac into conservatorship because they were "de facto" bankrupt. This situation was caused by the bad mortgages they have purchased that had been made with lowered lending standards. Although stockholders in Fannie Mae and Freddie Mac lost almost everything, those holding the agency securities issued by Fannie Mae and Freddie Mac lost nothing.

The yield spread between government agency securities and U.S. government securities reflects differences in liquidity and risk. The yield spread can be significant because secondary markets do not have the breadth and depth of Treasuries.

GSEs experienced tremendous growth in the last 15 years. Credit market debt outstanding, most of which are long-term securities, increased from about $700 billion at the end of 1994 to just under $3 trillion in early 2008. We take a closer look at the issues involved with some of the GSEs—those that relate to the mortgage market—in Chapter 14. GSEs are also covered in depth in Chapter 20.

In addition to government agency securities, the Federal Financing Bank, created in 1973, issues bonds to borrow for several federally related institutions. Among others, these institutions include the Commodity Credit Corporation, the General Services Administration, the Government National Mortgage Association, the Rural Telephone Bank, the Small Business Administration, and the Tennessee Valley Authority. The bonds issued by the Federal Financing Bank are backed by the full faith and credit of the U.S. government.

Recap Municipal securities are bonds issued by state, county, and local governments. The interest income on municipal securities is exempt from federal taxes and state income taxes for investors in the state where the municipals were issued. The interest on Treasury securities is exempt from state income taxes. Municipal securities may be either general obligation bonds or revenue bonds. Government agency securities are issued by government-sponsored enterprises, which are private enterprises that are publicly chartered by Congress and by the federal financing bank.

In the next section, we look at how bond prices are determined. The trends we have discussed affect the ultimate outcome in bond markets.

THE DETERMINANTS OF BOND PRICES

The price of a previously issued bond will be equal to the present value of the future stream of income from that bond. Once the bond has been issued, the coupon rate is relevant only in determining the coupon payment. The purchaser of the bond has a claim on a future income stream that is composed of the coupon payments and the face (par) value that will be received at maturity. It is the coupon payment and the face value of the bond that are relevant. The present value of the future income stream will determine the price at which the bond will currently trade and is determined by the current interest rate, not the coupon rate. When interest rates change, the prices of previously issued bonds change.

Recent Trends in the Bond Market

Bond markets in recent years can only be characterized as tumultuous at best, as the economy experienced unprecedented upheaval that began in the mortgage-backed securities markets. Overall, in late 2007 and 2008, bond prices rose as interest rates fell on worries of a sluggish economy that might depress interest rates and stock prices. The weakness in the economy accelerated in late 2008. The Fed made a series of historic interest rate cuts beginning in July 2007. The fed funds target rate was reduced from 5.25 percent in August 2007 to the range of 0 to .25 percent in December 2008. In January 2009, the Fed signaled that it did not intend to increase rates anytime soon.

As we saw in Chapter 5, interest rates and bond prices are inversely related. Therefore, it should be no surprise to money and banking students that bond markets and bond prices have been tremendously affected by the large interest rate declines in recent months. During late 2007 and 2008, bond prices rose and holders of previously issued bonds made large capital gains as interest rates fell. This was the opposite of what occurred from 2004 to 2006, when bond prices drifted lower as interest rates rose from their unusually low level in 2003 to the peak in mid-2007.

As of early 2009, several important factors were influencing bond markets. First was the ongoing difficulty in the residential mortgage markets. Increased risks on real estate-backed investments were causing a "flight to quality," increasing investor's demand for safe government bonds, not only in domestic markets, but also among global financial market participants. This pushed the prices of government securities up (and yields down) relative to other mortgage-related bonds and corporate bonds in general. Long-term Treasury yields fell into the 2 to 3 percent range. This drop in yields on Treasuries was much greater than the drop in yields for other securities. Thus, the risk premium for holding corporate bonds increased significantly and the spread between Treasury securities and corporate bonds widened as the crisis went forward in late 2008.

Second, the severely weakened economy saw real GDP contract 3.8 percent and the unemployment rate rise to over 7.2 percent in the last quarter of 2008. This would tend to push overall interest rates down on all securities as there was a reduced demand for borrowing in a faltering economy. However, counteracting these factors was the projected change in the size of the U.S. government's budget deficit. As the economy and tax revenues continued to decline into 2009, the government worked on a second stimulus package that was expected to amount to over $800 billion. The first stimulus package passed in September 2008 had been for $700 billion. It was expected that the decline in tax revenues and the increased bailout packages would cause the government deficit to explode. Without the second stimulus package, the deficit was expected to exceed $1.2 trillion for fiscal year 2009. Some analysts were predicting the deficit could go as high as $1.6 trillion. By itself, this represents a tremendous increase in the rate of issuance of new government securities, decreasing their price and increasing their returns. However, when all is considered,

with the dire shape of the economy in early 2009, it was unlikely that rates would increase much over the next year.

Because of these factors and uncertainties, the issuance of new securities in U.S. capital markets declined dramatically over the first three quarters of 2008, falling about 25 percent from the first three quarters of 2007 to $4.2 trillion. As to be expected, the sharpest declines were in those sectors most adversely affected by the slowdown while at the same time, the issuance of Treasuries increased. Thus, private asset-backed securities, global credit default obligations, and corporate long-term issuances each fell about 88, 80, and 30 percent respectively. New corporate bond issues plummeted in the third quarter due in response to lower corporate profits, increased uncertainty, and widening spread with Treasuries. Defaults on corporate bonds increased and initial public offerings fell over 75 percent from the third quarter of 2007. Also, the issuance of Treasuries increased about 23 percent to $668.4 billion with the sharpest increase coming the third quarter of 2008. Not as likely to be expected, the issuance of federal agency mortgage-backed securities also soared to $1 trillion in the first three quarters of 2008. These are securities primarily issued by the government-sponsored enterprises, Fannie Mae and Freddie Mac that were taken into conservatorship by the government in September 2008. The soaring agency securities were issued by Fannie Mae and Freddie Mac to make up for the steep decline in private mortgage-backed and asset-backed securities, despite the conservatorship. The newly issued agency securities now have an explicit government guarantee. The market for private mortgage-backed and asset-backed securities actually went from bad to worse as the financial crisis of 2008 unfolded. The markets froze up and buying and selling stopped in late 2008. Finally, under the Emergency Economic Stabilization Act of 2008, the Treasury was authorized to purchase $700 billion of these mortgage-backed securities and other securities which now had become "toxic." However, as of early 2009, no "toxic" securities had been purchased and there were no plans to use the bailout funds to do so. Rather, after Congress passed the bill, the use of the bailout funds was changed. Instead of purchasing "toxic" securities, the funds were to be used to inject capital into banks and for other purposes. The issuance of long-term municipals remained virtually the same. Despite the weak economy, the low interest rate environment encouraged new issues of municipals, which were higher than what they would have been without the favorable rates. Employment in the securities industry also declined over 3 percent in the last half of 2008. To date, this is far less than the over 20 percent decline in employment in the late 2000 to 2003 period in response to the bursting of the stock market bubble.

Sources

Securities Industry and Financial Markets Association (SIFMA), *Research Quarterly*, November 2008 available online at http://www.sifma.org/research/pdf/RRVol3-10.pdf

Securities Industry and Financial Markets Association (SIFMA), *Research Report*, January 21, 2009 available online at www.sifma.org/research/pdf/RRVol 4-1.pdf

To find its present value and, thus, the price at which the bond will trade in financial markets, we need to compute the present value of each coupon payment and the present value of the final repayment of the face value on the maturity date. The appropriate discount factor is the current interest rate on a security of equal risk, liquidity, and maturity.

The formula for the price of a previously issued bond is:

$$(12\text{–}2) \qquad P = C_1/(1+i)^1 + C_2/(1+i)^2 + \cdots + C_n/(1+i)^n + F/(1+i)^n$$

where

P = the price (present value) of the bond
C = the coupon payment on the bond (C_1 in year 1, C_2 in year 2, etc.)
F = the face or par value of the bond
i = the interest rate
n = the number of years to maturity (on a 5-year bond, $n = 5$)

Current Yield
The coupon payment divided by the current price.

You can see that the price of a bond is equal to its par value only when the coupon rate is equal to the current interest rate. The **current yield** on a bond is the coupon payment divided by the current price. For example, if a bond with a face value of $1,000, a coupon rate of 8 percent, is selling for $950, then the current yield is approximately $80/$950, or 8.4 percent. Likewise, the current yield will be equal to the coupon rate only when the price of the bond is the par value.

The formula in Equation 12–2 for determining bond prices is based on annual coupon payments. In reality, bonds usually make semiannual coupon payments. Here we consider refinements of how bond prices are determined when semiannual rather than annual coupon payments are made.

When a bond pays semiannual coupon payments of C/2 (assuming that C is the annual coupon payment) and this bond has n years to maturity, then $2 \times n$ payments (two payments per n year) will be made. The final payment at the end of n years of will be equal to F. To find the present value (P) of the stream of income, we divide the interest rate (i) by 2, since two interest payments of ^{i} i/2 over the course of the year will be equal to i. For example, if the coupon rate is 8 percent, two semiannual payments of 4 percent would approximate an 8 percent annual return. The appropriate discount factor for the final payment (F) is again $i/2$ because we consider $2n$ periods.

Equation 12–2 thus becomes:

$$(12\text{–}3) \qquad P = \left(\frac{C/2}{\left(1+\frac{i}{2}\right)^1}\right) + \left(\frac{C/2}{\left(1+\frac{i}{2}\right)^2}\right) + \cdots + \left(\frac{C/2}{\left(1+\frac{i}{2}\right)^{2n}}\right) + \left(\frac{F}{\left(1+\frac{i}{2}\right)^{2n}}\right)$$

where

P = the price (present value) of the bond
$C/2$ = the semiannual coupon payment on the bond
F = the face or par value of the bond
i = the interest rate
$2n$ = the number of 6-month periods to maturity (on a bond with 5 years to maturity, $n = 10$)

Note that we used the word "approximate" because semi-annual coupon payments of 4 percent would be greater than an 8 percent annual return if the effects of compounding are taken into account. That is, since the coupon payment made in the first half of the year would earn interest during the second six-month period, the annual return would actually be greater than 8 percent.

A simpler way to determine the price of a bond is to use a financial calculator. Financial calculators (along with directions) are widely available in campus bookstores and

office supply stores. As Exhibit 12–3 shows, the longer the term to maturity remaining, the larger the fluctuation in the price of the bond for any given change in interest rates.

In the case of bonds, the expected future cash flows are the coupon payment and the repayment of the face value at maturity. The amount is known with certainty unless the corporation or government entity runs into financial difficulties and cannot meet its obligations or if the bond is callable. The Treasury has not issued callable bonds since 1985. That is, unless the issuer defaults or calls the issue, the interest payments and the principal payments are known in advance and there is no chance that they will be more or less. This is different from the case of stocks, in which the cash flow payments in the form of dividends are uncertain.

Because of the federal government's power to print money and to tax, virtually no uncertainty exists that it will be able to meet its obligations. Therefore, Treasuries are considered to be default risk–free and the long-term government bond rate has been regarded as the risk-free rate. As previously discussed, Treasuries are still subject to an interest rate risk if the interest rate increases after the bond is issued and before it matures. In the case of Treasuries, the current Treasury bond rate is the discount factor that is used to find the bond prices of bonds with equivalent maturities. Thus, to find the price an investor would be willing to pay for a stream of income from a Treasury security with an original maturity of 20 years that was issued 10 years ago, the appropriate discount factor to use is the 10-year Treasury bond rate today. If this rate is above the coupon rate of the bond (interest rates have gone up since the bond was originally issued), the price of the bond will be less than the face value, and the bond will sell at a discount from par. If the current 10-year rate is below the coupon rate at which the bond was previously issued, the bond will sell at a premium above par.

Many factors affect the risk-free rate, and one of the most important is the stance of monetary policy. If the Fed increases the supply of reserves, short-term interest rates fall and the supply of credit is expanded; long-term interest rates also fall, but usually by less. Changes in inflationary expectations and the level of economic activity also affect long-term, risk-free interest rates. If inflation is expected to increase in the coming years, bond purchasers will require—and borrowers will be willing to pay—an inflation premium to compensate for the loss in purchasing power. Likewise, if income is increasing,

12-3

The Relationship Between Changes in Interest Rates and Changes in Bond Prices for Different Terms to Maturity

In this example, we are assuming that the original interest rate is 5 percent regardless of the term to maturity.[a] We consider what will happen to the bond price if the interest rate increases to 6 percent.

Term to Maturity	Original Price	New Price of Bond After Interest Rate Increase
10 years	$1,000	$926.41
20 years	$1,000	$885.30
30 years	$1,000	$862.35

Thus, the longer the term to maturity, the larger the change in the price of the bond for any given change in the interest rate, ceteris paribus. Can you explain why, in all cases, the bond will sell for less than its face value in the secondary market?

a. This is not usually the case, but could be if the yield curve were flat. This simplification is used for illustrative purposes only and does not alter the results.

the demand for loanable funds increases and puts upward pressure on interest rates. In the real world, these factors are interrelated. For example, expansionary monetary policy may cause market participants to expect higher inflation. Rather than leading to lower interest rates, interest rates may rise despite the expansionary monetary policy. Likewise, a recession brought on by higher oil prices may lead to higher interest rates if the impact of the higher oil prices affects inflationary expectations more than the drop in income. Other factors such as international capital flows and the amount of government borrowing also impact interest rates.

In the case of bonds that are not default-risk free, investors require that a risk premium be added to the risk-free return. The sum of the risk-free return plus the risk premium will equal the appropriate discount factor to use in determining the price of a bond, as depicted in Equation 12–4.

$$d = R_F + R_P \tag{12–4}$$

where
d = the discount factor
R_F = the risk-free rate
R_P = the risk premium

The question that remains is how the risk premium is determined. What is the risk premium that investors require as compensation in order to purchase the bonds rather than Treasuries? A major factor affecting the ability of the bond issuer to make payments as prescribed is the level of economic activity. In a booming economy, sales, revenues, and cash flows all facilitate the timely payment of the corporation's obligations. Likewise, in a recession or depression, cash flows may fall short of what is needed to meet scheduled payments.

The capital structure of a firm is composed of debt and equity. Debt reflects borrowing whereas equity reflects ownership in the form of stocks. The capital structure of a corporation, as reflected in its leverage ratio, affects the risk premium. The **leverage ratio** is the ratio of the firm's debt relative to its equity. Other things being equal, the higher the leverage ratio, the greater the risk to bondholders and the higher the risk premium will be. The reason is that if a highly leveraged firm experiences a substantial decline in earnings, it may default on its debt obligations and be forced into bankruptcy. A firm with a low leverage ratio could weather a decline in earnings by cutting dividends to stockholders, which are residual claims, not contractual obligations. The highly leveraged firm does not have this option: It must pay its debt costs or fold. Therefore, firms that have considerable debt relative to equity will find the cost of debt financing to be relatively high.

Leverage Ratio
The ratio of the firm's debt relative to its equity.

Finally, other firm-specific or industry-specific conditions can exist that affect the ability of a corporation to meet its debt obligations. To the extent that these factors exist, the risk premium is affected. Some of these factors include labor disputes, lawsuits such as those against the tobacco industry, losses in international markets, and oil shortages.

As you may have guessed, the credit rating of the issuing corporation will affect the risk premium because it should capture the firm, industry, and economy risk factors. The factors that affect the risk-free return and the risk premium are summarized in Exhibit 12–4.

Recap The price of a bond is the discounted value of the future stream of income over the life of the bond. When the interest rate increases, the price of the bond decreases. When the interest rate decreases, the price of the bond increases. The longer the term to maturity, the greater the fluctuation in the price of the bond for any given change in the interest rate.

12-4 Factors That Affect Bond Prices

Factors that affect the risk-free rate:

- The stance of monetary policy
- Changes in inflationary expectations
- Changes in the level of economic activity
- Changes in capital inflows
- Changes in government borrowing

Factors that affect the risk premium:

- The credit rating of the bond as determined by Moody's and Standard & Poor's
- The economic outlook
- The capital structure of the firm
- Other firm-specific conditions
- Losses in international markets

The discount factor used to determine the price of a bond includes a risk-free rate and a risk premium. Treasury bonds are considered to pay a risk-free rate of return. The risk premium encompasses both economy-wide and firm/industry-specific risks.

In the next two chapters, we examine the stock and mortgage markets, which are the two remaining dominant capital markets.

Summary of Major Points

1. Bonds are debt instruments issued by the U.S. government; an agency of the government; a state, county, or local government; a domestic or foreign corporation; or a foreign government. The coupon payment is based upon the par (face) value multiplied by the coupon rate. They may be bearer bonds or registered bonds. Bonds are rated by Moody's, Standard & Poor's, and Fitch with regard to creditworthiness.
2. The terms of a corporate bond issue are spelled out in the bond indenture and interpreted and enforced by the trustee. Bond indentures may include sinking fund provisions, call provisions, convertibility provisions, and other restrictive covenants that limit the behavior of the corporation. In addition, the newly issued bonds may come with warrants. Mortgage and collateral bonds are issued by corporations and are backed by real or financial assets. In the event of a default, debenture bondholders are entitled to be paid before subordinated debenture bondholders. Corporations also issue zero-coupon bonds that do not pay interest but are sold at a discount, with the difference between what the bond sells for and the amount that is received at maturity being equal to the interest. Secondary markets exist to trade previously issued corporate bonds.
3. Treasury securities, considered to be free from default risk, may be purchased from a market maker or directly from the Federal Reserve. Interest rates on Treasury securities serve as a benchmark to judge the riskiness and liquidity of other securities. The secondary market for government securities is the largest secondary market in the world. Treasury bonds are subject to an interest rate risk.
4. Hybrid Treasury securities include STRIPS and inflation-indexed bonds. STRIPS allow the coupon and principal payments of government securities to be sold separately at a discount. Investors avoid the uncertainty that coupon payments may have to be reinvested at a lower interest rate because rates have fallen since the security was issued. Inflation-indexed bonds were first offered in

1997. The principal amount of an indexed bond is adjusted for inflation at the time when an interest (coupon) payment is made. The interest rate does not change, but the interest payments are based on the inflation-adjusted principal.

5. Municipal bonds are issued by state and local governments. Interest income on municipal securities is exempt from federal and state taxes for investors living in the issuing state. General obligation bonds are repaid out of general tax revenues. Revenue bonds are repaid from the revenues of a specific project that the bonds support. Government agency securities are issued by private enterprises that are publicly chartered by Congress to reduce the cost of borrowing in specific areas.
6. Bond markets have grown significantly, fueled by increases in nonfinancial corporate bonds and bonds issued by government-sponsored enterprises. Foreign entities have made substantial net purchases of domestic bonds, increasing the supply of funds flowing into this market. In total, the trend is for increasing capital flows across borders and the globalization of finance.
7. The price of a bond is the present value of the future cash flows associated with the bond. When the interest rate increases, the price of the bond decreases. When the interest rate decreases, the price of the bond increases. The longer the term to maturity, the greater the fluctuation in the price of the bond for any given change in the interest rate.
8. The discount factor used to determine the price of a bond includes a risk-free rate and a risk premium. Treasury bonds are considered to pay a risk-free rate of return. The risk premium encompasses both economy-wide and firm/industry-specific risks. Economy-wide factors include the stance of monetary policy, expected inflation, and the level of economic activity. The major firm/industry factors include the capital structure of the firm, the economic outlook for the firm, and the credit rating of the bond issuance.

Key Terms

Bearer Bonds, p. **268**
Bond Indenture, p. **270**
Call Provisions, p. **270**
Collateral Bonds, p. **271**
Convertible Bonds, p. **270**
Coupon Rate, p. **268**
Current Yield, p. **289**
Debenture Bonds, p. **271**
Government Agency Securities, p. **287**
Government-Sponsored Enterprises, p. **287**
I Savings Bonds (I-Bonds), p. **284**
Leverage Ratio, p. **291**
Mortgage Bonds, p. **271**
Municipal Bonds (Munis), p. **286**
Primary Dealers, p. **275**
Registered Bonds, p. **268**
Restrictive Covenants, p. **271**
Sinking Fund Provisions, p. **270**
Subordinated Debenture Bonds, p. **271**
Treasury Inflation-Protected Securities (TIPS), p. **284**
Treasury STRIPS, p. **283**
Warrant, p. **271**
Zero-Coupon Bonds, p. **271**

Review Questions

1. Define par (face) value, coupon rate, coupon payment, and current yield.
2. What is the difference between bearer and registered bonds?
3. What are inflation-indexed bonds? How do they reduce the risk of holding long-term bonds? Does the interest rate on inflation-indexed bonds change after they have been issued?
4. Why are interest rates on Treasury securities used as a benchmark to judge the riskiness and liquidity of other securities?
5. What are the advantages of investing in STRIPS rather than Treasury securities that make regular interest payments?
6. What is a bond indenture? What is the role of the trustee?
7. What is the purpose of restrictive covenants? Of sinking funds? Of call provisions?
8. What are warrants?
9. Are revenue bonds as safe as general obligation bonds?

10. What are the reasons for differences in the interest rate on Treasury securities and on government agency securities? Between Treasuries and municipals?
11. What roles do Moody's, Standard & Poor's, and Fitch play in the bond market?
12. Discuss what will happen to the discount factors used to determine prices of previously issued bonds sold in secondary markets, given the following scenarios:
    a. A company's earnings report comes in much lower than expected.
    b. Your college is suffering from declining enrollments, particularly among students who want to live on campus. Revenue bonds have been issued to finance your college dorm.
    c. Fed policy turns expansionary.
    d. The performance of the economy is particularly strong.
13. Discuss recent trends in the bond market.
14. Why is the coupon rate irrelevant in determining the price of a previously issued bond? What factors are important in determining the price of a previously issued bond?
15. When will a bond sell in the secondary market for its face value?
16. When will a bond sell in the secondary market for less than it's face value? For more than it's face value?

Analytical Questions

17. Can you explain why the bonds in the Cracking the Code boxes on pages 273 and 284 are selling at premiums above par?
18. A Treasury bond pays a 7.25 percent coupon yield. What is the coupon payment per $1,000 face value?
19. A bond has a face value of $1,000, a coupon rate of 7 percent, and a selling price of $9,900. What is the current yield? What has happened to interest rates since the bond was issued?
20. If a bond pays $80 in interest annually and sells for $1,050, what is its current yield? What would the bond have to sell for to have a current yield of 8 percent?
21. Compare the current yield on a one-year T-bill that sells for $9,400 and can be redeemed for $10,000 with the yield on a bond with a face value of $10,000 that pays a coupon yield of 8 percent and sells for $9,800.
22. If the interest rate on a corporate bond is 10 percent, in equilibrium, what will the rate on a muni be with comparable risk, maturity, and liquidity if the average marginal tax rate is 20 percent?

Suggested Readings

Information regarding Treasury securities and auctions can be found on the Treasury's Internet site: **www.treas.gov.**

The New York Fed describes the operation of the Treasury STRIPS program at **www.newyorkfed.org/aboutthefed/fedpoint/fed42.html.**

Basic information about inflation-indexed bonds can be found at **www.treasurydirect.gov/indiv/products/prod_tips_glance.htm.**

For a forecast of the bond market in 2008, see Research, U.S. Market Outlook, the Securities Industry and Financial Markets Association (SIFMA), January 2008. It is available online from the SIFMA Web site at **www.sifma.org.**

On the topic of TIPS, see "Reflections on the Treasury Inflation-Protected Securities Market," a speech by William C. Dudley at the Forecasters Club, New York City, on December 13, 2007. It is available online at **www.newyorkfed.org/newsevents/speeches/2007/dud071213.html.**

In "The Corporate Bond Credit Spread Puzzle," Jens Christensen discusses the current bond market conundrum. It is found in the *Federal Reserve Bank of San Francisco Economic Letter*, Number 2008–10, March 14, 2008. Christensen writes another cogent article "Treasury Bond Yields and Long-Run Inflation Expectations," also in the *Federal Reserve Bank of San Francisco Economic Letter*, Number 2008–25, August 15, 2008.

To understand inflation-indexed debt, see Brian Sack and Robert Elsasser, "Treasury Inflation-Indexed Debt: A Re-

view of the U.S. Experience," *Economic Policy Review*, Federal Reserve Bank of New York (May 2004): 47–63.

For a complete look at all aspects of the bond market, see Frank J. Fabozzi, *Bond Markets: Analysis and Strategies*, 5th ed. (Upper Saddle River, NJ: Prentice Hall, 2004).

For a discussion of high-yield (junk) bonds, consult Glenn Yago, *Beyond Junk Bonds: Expanding High-Yield Markets* (New York: Oxford University Press, 2003).

For an article that gives some perspective on the international bond market, see Jane D'Arista, "Assessing International Banking and Bond Markets," *Capital Flows Monitor* (December 19, 2000).

For a further discussion of some of the theoretical issues raised in this chapter, see Franklin R. Edwards, *The New Finance* (Washington, DC: AEI Press, 1996).

For a complete look at all aspects of the bond market, see Frank J. Fabozzi, *Bond Markets: Analysis and Strategies*, 4th ed.,(Upper Saddle River, NJ: Prentice Hall), 1999.

For a more thorough discussion of inflation-indexed bonds, see Pu Shen, "Features and Risks of Treasury Inflation Protection Securities," *Economic Review of the Federal Reserve Bank of Kansas City* 83:1 (First Quarter 1998): 23–38.

For a discussion of high-yield bonds, see Theodore M. Barnhill, William Maxwell, and Mark R. Shenkman, eds., *High-Yield Bonds* (New York: McGraw-Hill), 1999.

For an article that gives some perspective on the International bond market, see Jane D'Arista, "Assessing International Banking and Bond Markets," *Capital Flows Monitor* (December 19, 2000).

Endnotes

1. Alan Greenspan, Monetary Policy Report to Congress, February 16, 2005.
2. Recall that Treasury bills are sold at a discount.
3. Over 97 percent of the dollar value of trading activity on the New York Stock Exchange involves the trading of stocks, which is why we defer a more lengthy discussion until the next chapter on the stock market.
4. Actually, starting in 1982, some brokers and dealers were discounting coupon payments and principal payments of long-term Treasuries in a way that is similar to the STRIPS program. Creation of the Treasury-sponsored STRIPS program eliminated the need for these less efficient, privately managed programs.
5. As we saw in Chapter 3, the marginal tax rate is the tax rate on the last dollar of taxable income. Taxpayers, depending on their individual incomes, are in different marginal tax brackets, some high and some low. The average marginal tax rate is somewhere between the high and the low marginal tax brackets. Because of substitution, the interest rate on municipal securities will gravitate to the rate that makes the "average" taxpayer (in the average marginal tax bracket) indifferent between municipals and similarly rated corporate securities.

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CHAPTER THIRTEEN 13

Buy low, sell high!

The Stock Market

Learning Objectives

After reading this chapter, you should know:

The major characteristics of the stock market

How the organized exchanges and over-the-counter markets function

What the various stock indexes are and what each measures

How the value of a share of stock is determined

SPECULATIVE BUBBLES AND THEIR EFFECTS ON THE ECONOMY

Many readers are likely aware of recent stock market ups and downs. The late 1990s saw a record stock market boom. Stock prices underwent dramatic increases despite some sharp sell-offs. Technological changes in the transfer of funds, increased globalization of financial markets, and other structural changes in the economy facilitated the flow of funds into equity investments around the world. In the early 2000s, the stock market collapsed when faltering economies, here at home and abroad, could not support the stratospheric prices of the late 1990s. Stock prices zoomed upward again in the period between 2003 and 2007 before dropping about 45 percent between October 2007 and March 2009. From March toward the end of 2009, markets were again on an upward path.

At the same time, more households than ever were and are investing in the stock market, whether directly through brokers, employers, or online or indirectly through savings or retirement plans. In 2009, more than 100 million Americans owned shares of stock through individual investments or through mutual funds.

When stock price movements are more pronounced, as in the late 1990s, stock markets have greater potential for speculative bubbles that cannot be sustained. A **speculative bubble** is an irrational increase in prices accompanied by euphoric expectations. When market participants realize that the speculative bubble cannot be maintained, they tend to liquidate their positions, with the result that prices fall to lower levels than had the bubble not occurred in the first place. Such volatility in stock prices can cause financial instability as gains and losses are magnified. When the bubble bursts, as it did in the early 2000s, the resulting financial losses may spill over into the real sector, causing or contributing to unemployment and recession.

Speculative Bubble
An irrational increase in stock prices accompanied by euphoric expectations.

In Chapter 9, you saw that the Fed attempts to minimize fluctuations in output and prices around a long-term trend. In that chapter, we were concerned about output prices of goods and services. But, as the preceding discussion implies, the Fed must also be concerned about unstable stock and real estate prices. Volatile stock and real estate prices can affect employment, inflation, and the health and stability of the financial system. If a speculative bubble bursts and stock or real estate prices tumble, the real sector can be adversely affected for a considerable time. *The Economist* magazine aptly stated: "Just as champagne tastes wonderful until the bubbles go to your head, so financial bubbles tend to create nasty economic hangovers."[1]

The stock market rally of the late 1990s was interrupted briefly by a worldwide collapse of stock prices in October 1998. By early 1999, the market had fully recovered. In early 2000, the market reached a cyclical bull high and then turned down. An economic downturn began in early 2001 and was exacerbated by the attack on the World Trade Center and the Pentagon on September 11, 2001. The market experienced three down years (2000, 2001, and 2002) and the worst bear market in history. By the end of 2002, stock markets had bottomed, and stock prices began an upward trend in 2003, which continued until October 2007. Over this five-year period, the Dow Jones Industrial Average, the most famous measure of average stock prices, had nearly doubled. However, as noted earlier, in 2008 stocks were caught up in the same financial crisis as other financial markets. The precipitous drop in prices was due more to the financial crisis of 2008 rather than the bursting of a speculative bubble as in the earlier time period. The accompanying "A Closer Look" feature on p. 299 looks more closely at how volatile asset prices affect the economy.

How Volatile Asset Prices Affect the Economy

In late 2008, it appeared the U.S. economy may be heading for (or in) a deep recession due to the ongoing financial crisis. The crisis began with falling real estate prices, which led to the collapse of the subprime mortgage and mortgage-backed securities markets and quickly spread to other domestic and global financial markets and assets. The United States had last experienced a recession in 2001, and the primary cause of this downturn seems to have been declining stock prices.

The 2001 recession ended a U.S. expansion of more than 10 years. Many analysts attribute part of the downturn to the cataclysmic collapse of the overvalued stock markets that began in 2000.[a] Stock prices, led by dot.com[b] and technology stocks, experienced record increases in the late 1990s. Some analysts believed that stocks were overvalued as early as 1995. Between 1995 and 2000, stock prices more than doubled. By 2000, it was becoming clear that stock valuations were in a speculative bubble. Markets collapsed, with the dot.com and technology sectors experiencing the largest and earliest price declines. The Federal Reserve Board responded by lowering interest rates 11 times in 2001. As noted earlier, the stock markets hit bottom by early 2003 but then recovered, with major stock indices nearly doubling from 2003 to 2007. This period of increasing stock prices seems to have been fueled by low interest rates and the interrelated general economic recovery. Low interest rates also fueled the housing market and resulted in increasing real estate prices. By late 2007, it appeared the real estate bubble was "bursting," just as some economists had been predicting. While falling stock prices may have caused the 2001 recession, falling home prices seemed primarily responsible for the downturn and eventual financial collapse in 2008.

Given these trends, it seems apparent that asset prices are undergoing more pronounced fluctuations than in the past. Some of the reasons for this could be technological modifications in how funds are transferred and other structural changes in capital markets.[c] For example, technological improvements in electronic funds transfer systems and increased globalization of capital markets allow funds to flow more freely and quickly around the world. Although this increased the efficiency of financial markets, the speed with which financial flows could occur increased price swings. Other innovations, such as securitization of mortgage loans, have also made financial assets more liquid than in the past. At the same time, more households than ever before are investing in the capital markets, whether directly through a broker, through their employer, or online, or indirectly through a savings or retirement plan. And in recent years, an unprecedented number of homeowners have refinanced their homes in order to extract funds from them to be used for consumption, home renovation, or other investments.

Volatile asset prices can affect the real sector via several channels. One channel is the link between changes in asset prices and wealth. When asset prices increase, nominal wealth increases. The increases in wealth, in turn, can lead to spending increases in the goods and services markets and a willingness to take on more debt. Exclusive shops on Rodeo Drive in Beverly Hills had exceptional years in the late 1990s

after the historic run-up of stock prices. Apparently investors spent some of their profits on high-end luxury items or increased their level of debt to purchase luxury items. Similarly, the less affluent may notice large increases in the value of their retirement accounts, feel better off as a result, and therefore consume more now.

These increases in spending and debt in response to gains in wealth speed up the level of economic activity. If sustained, the increases in demand can also cause prices in the goods and services market to rise. Thus, inflation in asset markets may, after some time, spill over to cause inflation in the goods and services sector.

The flip side, of course, is that decreases in asset prices can trigger declines in spending and, eventually, price reductions in the goods and services markets. For example, if the value of an individual's stock portfolio falls from $100,000 to $50,000 when the market crashes, they experience a drop in wealth and subsequently may not take an expensive trip they had been planning. The reduced demand for vacation trips will slow economic activity and lead to prices being lower than they would otherwise have been. If asset prices are stable or change slowly, these spillovers do not affect spending, saving, borrowing, and lending decisions as dramatically as when asset prices are more unstable.

Volatile stock and real estate prices also affect the real sector through their effect on financial institutions and the financial system. The solvency of any institution that holds large amounts of stocks, bonds, and mortgages could be threatened if prices fall unexpectedly and significantly. Financial institutions, in particular, may see the value of their assets decline sharply, while their liabilities, which are denominated in dollars, do not fall in value. Entire industries may be affected. For example, the U.S. savings and loan industry experienced enormous losses in the 1980s because of declines in the value of mortgages and other capital market assets. The value of mortgages can fall when declining real estate values cause some borrowers to default, or when rising interest rates decrease the value of outstanding mortgages. The resulting savings and loan crisis caused unemployment and bankruptcies in the industry and required a taxpayer bailout.

In other episodes, globalized financial markets have facilitated capital flows that ultimately contributed to speculative bubbles. The Mexican financial crisis of 1994–1995 and the Asian financial crisis of the late 1990s are examples of situations in which stocks, supported by large capital inflows, became overvalued. When exchange rates could not be maintained, what began as currency crises quickly spread to other markets. Stock, bond, and real estate prices plummeted, causing widespread bankruptcies of financial and nonfinancial firms. The financial systems and real sectors of the affected economies collapsed. Unprecedented international intervention was needed as domestic and international investors withdrew funds from the crippled regions. It became clear that investors were able to reverse capital flows just as quickly as individual consumers were able to cancel their vacation plans when the value of their stock fell.

Endnotes

a. The downward pressure on the U.S. economy was also greatly exacerbated by the attacks on the World Trade Center and the Pentagon on September 11, 2001, and the resulting economic turmoil.
b. Dot.com stocks are those of Internet companies, many of which in the 1990s were small start-up companies that had never earned a profit.

c. In Chapter 5, we saw that prices of long-term fixed rate debt instruments, including bonds and mortgages, fluctuate a great deal in response to small changes in interest rates. Money market assets are short term and do not experience such price volatility when interest rates change. In this and the next chapter, we are referring primarily to capital market assets.

THE ANATOMY OF STOCKS

Firms issue shares of stock when they need to raise long-term financial capital, usually for investment spending. If a corporation is publicly held, shares of stock are sold to the public. A share of stock represents equity in a corporation and entitles the owner to a share of the corporation's profits.[2] The stock may be **preferred stock** or **common stock.** Owners of preferred stock receive a fixed dividend to which they are entitled before owners of common stock can receive anything. The fixed dividend is similar to the interest payment that a bondholder receives. However, dividends must be paid to preferred stockholders only if the corporation earns a profit, whereas the corporation is liable for interest payments under all circumstances. In addition, interest payments to bondholders are tax write-offs for the corporation; dividend payments to preferred stockholders are not.

Preferred Stock
Restricted equity claims with characteristics of both bonds and common stock. While dividends must be paid to preferred stock holders before common stock holders, preferred dividends are set at a specific level and do not increase if extraordinary profits are earned. Preferred stock holders generally do not have voting rights.

Common Stock
Equity claims representing ownership of the net income and assets of a corporation. Common stock holders are "residual claimants," since their dividends are paid out of profits remaining after payment of interest to lenders and dividends to preferred stock holders. Common stock holders may vote for the Board of Directors, and thus have the potential to exert control over decisions of managers.

Common stockholders receive a variable dividend after preferred stockholders have been paid and retained earnings have been set aside. Retained earnings are profits not distributed to stockholders that are usually used to fund investment projects. In the 1990s, some "growth" companies such as Microsoft did not pay dividends. In this case, stockholders benefit from increases in the stock's price generated by putting the earnings back into the company or using the earnings to purchase back the company's own stock. In 2004, the popularity of not paying dividends was adversely affected by legislation that reduces taxation of most dividends received by households.[3] If a company buys back its own stock and does not resell it, the stock is retired. After shares of stock are retired, the remaining outstanding shares tend to appreciate in value. Common stockholders have voting rights within the firm, whereas preferred stockholders do not. Stockholders who own only a minuscule share of the outstanding stock of a firm do not usually exercise voting rights.

Investment bankers usually market new shares of stocks, or securities. One or more securities firms design and market the new securities offering. Sometimes, employees and individuals may purchase new shares of stocks directly from the company, thus bypassing investment banks. Stocks represent liquid claims because the shares can usually be sold relatively easily in secondary markets. Previously issued shares of stock are traded either on organized exchanges or over the counter. As you saw in Chapter 3, the marketing of newly issued shares represents primary market activity while the purchase or sale of previously issued securities represents secondary market activity. "Cracking the Code" on p. 302 deciphers the information about stock prices reported in major newspapers. As noted in Chapter 4, the investment banking industry is undergoing significant change with regards to organization and structure as a result of the financial crisis of 2008.

Households, state and local governments, foreigners, and a variety of financial institutions hold domestically issued stocks. The major financial institutions that own shares of stocks are mutual funds, private and public pension funds, and insurance companies.

The value of corporate equities increased dramatically in the 1990s, reversed course in the early 2000s, resumed rising after 2003, and then fell dramatically from

Cracking the Code

The Stock Market

Here is a section from a typical stock page of a major newspaper. To begin cracking the code, look at the following entry for Gap Inc., the popular clothing store.

The name of the company is in the third column, followed by the company ticker symbol and then the regular annual dividend paid by Gap, in this case, $0.08. The price of the stock at the close of the preceding day's trading was $18.86 (from the column labeled Close). The dividend is usually divided by the closing price to get the current yield (or return). The dividend of $.08 divided by the closing price $18.86 gives a current yield of .4 percent ($.08/$18.86 = .004%).

The column labeled PE indicates that the ratio of the price per share to the earnings per share of the company—that is, the price-to-earnings (P-E) ratio—is 19.92. The higher the earnings per share of the company (given the price of the stock), the lower the ratio. Stocks with low PE ratios compared to other firms in the industry are sometimes thought to be undervalued, and stocks with high PE ratios are thought to be overvalued.

The Vol column tells us the number of shares traded (in hundreds) on a given day. Thus, 64162 means that 6,416,200 shares of Gap were traded on this particular day. The price of the stock at the close was, as mentioned, $18.86. In the last column, the closing price per share was down 0.16 ($0.16) from the close of the previous day.

To the left of the company's name are two columns headed High and Low. These are the high and low prices of the stock for the last 52 weeks. Gap had traded at a low price of 15.20 ($15.20) and at a high price of 21.39 ($21.39). Those of you who bought at 15.20 ($15.20) can smile.

52 Weeks									
High	Low	Stock	Sym	Div	Yld.%	PE	Vol 100s	Close	Net Change
21.39	15.20	Gap Inc	GPS	0.08	0.4	19.92	64162	18.86	–.16

Source: The Wall Street Journal (October 16, 2007).

July 2007 until March 2009 before recovering. Exhibit 13-1 traces the outstanding value of corporate equities since 1982.

After the banner years of the 1990s, stocks did not fare as well in the early 2000s, when the value of outstanding corporate equities fell for three consecutive years to just under $11 trillion by the end of the third quarter 2002. As noted earlier, in early 2003, the market again began rising and continued its upward trend until July 2007. On September 30, 2007, the outstanding value of domestic corporate equities was over $26 trillion. This was up from $11.9 trillion just five years earlier and from $2.6 trillion twenty years earlier.

In 2008 stock prices experienced large fluctuations and moved dramatically downward as the financial crises, the government bailout of the financial system, and the likelihood of a deep recession filled headlines. By the end of the third quarter of 2008, the value of outstanding corporate equities had fallen to $19.6 trillion.

Securities and Exchange Commission (SEC)
A government agency created by the Securities and Exchange Act of 1934 that regulates disclosure rules for companies that issue publicly traded shares of stock.

All companies that issue publicly traded shares of stock are regulated by the **Securities and Exchange Commission (SEC),** which was created by the Securities and Exchange Act of 1934. The SEC has broad disclosure requirements to protect investors by requiring companies to file numerous reports detailing their financial condition, information about key personnel, and any changes that would be important to stockholders. The SEC also has extensive authority to regulate secondary market activities.

13-1
The Value of Outstanding Shares of Domestically Issued Stock Since 1982 (Billions of Dollars at Year's End)

Year	Corporate Equities
1982	$1,562.5
1983	1,856.0
1984	1,789.2
1985	2,270.4
1986	2,682.6
1987	2,710.3
1988	3,076.3
1989	3,819.7
1990	3,542.6
1991	4,863.4
1992	5,430.9
1993	6,306.2
1994	6,333.3
1995	8,495.7
1996	10,255.8
1997	13,201.3
1998	15,427.8
1999	19,522.8
2000	17,627.0
2001	15,310.6
2002	11,900.5
2003	15,618.5
2004	17,389.3
2005	18,512.0
2006	20,016.8
2007	22,445.0
2008*	16,023.8

*As of September 30, 2008.
Source: Flow of Funds of the United States, Z.1, Board of Governors of the Federal Reserve System, various issues.

STOCK OFFERINGS

Initial Public Offering (IPO)
When a corporation issues stocks publicly for the first time.

An **initial public offering (IPO)** is public offering of stock by a corporation for the first time. Many companies that have gone public in recent years are well known to college students. Some of them are Ben and Jerry's Ice Cream, California Pizza Kitchen, Martha Stewart Living, Omnimedia, Guess? and Krispy Kreme Doughnuts, as well as a rash of Internet start-up companies such as Google in 2004 and NetSuite in 2007. Stock prices often move dramatically on the first day of trading. For example, on the first day of trading, California Pizza Kitchen's stock jumped 35 percent, Krispy Kreme Doughnuts' stock jumped 75 percent, and Red Hat, Inc., an Internet company, saw its stock jump more than 80 percent. But these returns look puny compared to Google, whose stock rose from an initial $85 in August 2004 to $491.52 by mid-August 2007, a 478 percent return over a three-year period. On January 30, 2009, Google opened at $344.69 a share.

But the experience of the Internet offerings of the late 1990s teaches a sobering lesson. Most of their price jumps did not last through a general downturn in Internet stocks in mid-2000. For example, Red Hat debuted in mid-1999 at $15 a share, rose to $151.31 by late 1999, fell to $3.81 a share by August 10, 2001, and was trading at $14.70 a share on January 30, 2009.

Secondary Stock Offering
An offering of newly issued shares by a firm that already has outstanding publicly held shares.

A **secondary stock offering** is an offering of newly issued shares by a firm that already has outstanding publicly held shares. To bring new shares to the market, a

Looking Back

Famous Financial Quotations

"Stock prices could double, triple, or even quadruple tomorrow and still not be too high. Stocks are now, we believe, in the midst of a one-time-only rise to much higher ground—to the neighborhood of 36,000 for the Dow Jones Industrial Average."

—James K. Glassman and Kevin A. Hasset, "Dow 36000," *The Atlantic Online* (September 1999), **http://www.theatlantic.com**

"In a [stock] market like this, every story is a positive one. Any news is good news. It's pretty much taken for granted now that the market is going to go up."

—*The Wall Street Journal* (August 26, 1987), less than two months before the largest percentage drop in stock prices in history

Although there have been many stock market crashes, the most famous occurred in 1929, heralding the Great Depression. Although it was not known at the time, output had actually turned down before the market crashed. The market crash came at the end of a decade of rising stock prices and what many now realize was a speculative bubble. The following are some quotations from around that time:

"There will be no interruption of our permanent prosperity."

—Myron E. Forbes, president, Pierce Arrow Motor Car Co. (January 12, 1928)

"I cannot help but raise a dissenting voice to statements that we are living in a fool's paradise, and that prosperity in this country must necessarily diminish and recede in the near future."

—E.H. Simmons, president, New York Stock Exchange (January 12, 1928)

"Stock prices have reached what looks like a permanently high plateau. I do not feel that there will soon, if ever, be a fifty- or sixty-point break below present levels, such as Mr. Babson has predicted. I expect to see the stock market a great deal higher than it is today within the next few months."

—Irving Fisher, one of the most prestigious economists of the day (October 16, 1929)

"I believe that the breaks of the last few days have driven stock prices down to hard rock. I believe that we will have a ragged market for a few weeks and then the beginning of a mild bull movement that will gain momentum next year."

—Irving Fisher (October 22, 1929)

Shelf Registration
A procedure that permits a company to register a number of securities with the SEC and sell them over a two-year period rather than at the time of registration.

corporation must register the new issue with the SEC. Since 1982, the SEC has allowed corporations to register securities without immediately issuing them; this procedure is called shelf registration. **Shelf registration** permits a company to register a number of securities and sell them over a two-year period rather than at the time the shares are registered. This avoids the costs in time and money of several registration processes and allows the firm to respond quickly to advantageous market conditions.

Recap Stocks represent equity in a corporation. Preferred stockholders receive a fixed dividend, and common stockholders receive a variable or no dividend. Firms issue stock to raise funds for long-term investment spending. An IPO is a public offering of newly issued stocks by a corporation that has not previously sold stocks to the public. A secondary stock offering is an offering of newly issued stocks by a firm that has publicly held stocks outstanding. Shelf registration permits a company to register new shares of stocks at the present time but to issue the new shares over a two-year period.

THE STOCK MARKETS

When most people think about the stock market, they think of New York City's Wall Street, an actual street in South Manhattan that is home to New York's financial district and is also the nation's financial center. For financial market participants, however, Wall Street has a much broader connotation that includes many different organized stock exchanges and a nationwide network of brokers and dealers who buy and sell stock over the counter. In recent years, the volume and values of stocks traded—whether on exchanges or over the counter—have increased dramatically. Large institutional investors such as pension funds, insurance companies, and mutual funds have come to dominate the market. The institutional investors tend to trade large blocks of stocks (more than 10,000 shares of a given stock or trades with a market value higher than $200,000). Institutional investors, who owned only 7.2 percent of all equities in 1950, now own over 60 percent of the market valuation of all stock. The expanded use of computers to execute trades has accommodated the increased volume of trading and facilitated an increase in **program trading** by institutional investors. Program trading allows institutional investors to preprogram computers to buy or sell a large number (basket) of stocks. The NYSE has recently changed the way it measures the amount of program trading. Using current mythology which results in lower values, approximately 30–35 percent of trades were the result of program trading in the early weeks of 2009.

Program Trading
The preprogramming of computers to buy or sell a large number (basket) of stocks, usually by institutional investors.

Despite the increase in institutional trading, a higher percentage of households have a stake in the stock market than ever before, usually through retirement funds, direct ownership, or ownership of mutual funds. In 1989, only 31.6 percent of households owned stock in some form, but by late 2007 that percentage had increased to more than 50 percent. While high, this percentage is still less than the comparable figure of 62 percent for home ownership. As of September 30, 2007, households owned stocks and mutual funds valued over $11.29 trillion. As Exhibit 13-2 shows, investing in the stock market has over time paid a higher total return than investing in the bond market or purchasing other financial assets. Other factors being equal, ownership of stocks entails a greater risk than ownership of bonds or other financial assets. Even though there is a higher expected return with stock ownership, there is no guarantee that any given investment will realize a higher return. Moreover, most financial assets issued by depository institutions offer the added advantage of deposit insurance. Stockholders own the excess, whether paid out in dividends or not, of what is left over after bondholders and other creditors have been paid fixed obligations. The residual may be huge, but then again it may fall short of expectations.

Margin Requirement
The percentage of invested funds that can be borrowed as opposed to being paid in readily available funds; currently, margin requirements are set by the Fed at 50 percent.

Investors do not have to put up funds equal to the full value of a stock purchase. Instead, they can purchase stocks on the margin ("buying on the margin") by borrowing. The **margin requirement** is the percentage of a stock purchase that can be borrowed as opposed to being paid in readily available funds. The current margin requirement, which is set by the Fed, has been 50 percent since 1974, and applies only to initial purchases. Buying on the margin allows an investor to amplify gains when the stock's price

Source: MSN Money, accessed online February 6, 2008, at **http://moneycentral.msn.com/.**

goes up because the investor has control, in essence, over a larger number of shares. It is thought that margin buying fuels speculation in stocks and can be particularly dangerous in a stock market bubble.

Maintenance Margin Requirement
The minimum amount of equity the investor needs in his account relative to the market value of his stock.

The New York Stock Exchange and the National Association of Securities Dealers require member firms to impose a minimum 25 percent **maintenance margin requirement** (also know as "minimum maintenance" or "maintenance requirement") on their customers. The maintenance margin requirement is the minimum amount of equity the investor needs in his or her account relative to the market value of the stock. The maintenance requirement becomes relevant if the stock has been purchased using borrowed funds and if the stock's value falls so that the investor has less equity than the amount required by the maintenance margin. Many individual brokerage firms set higher margin requirements and vary those requirements, depending on the stocks and trading behavior of individual customers. For example, assume that an investor purchases a share of stock for $100 with $50 of his or her own funds and borrows the rest from a broker. If the stock falls to $80, the owner has $30 equity in the stock, considering that there is a $50 loan. If there is a 25 percent maintenance margin requirement imposed by a broker or the exchange, the owner must have at least $20 (.25×$80) equity in the stock. The owner has $30 equity, so all is well. If the stock falls to $60 per share, the owner's equity falls to $10 ($60 less the $50 loan). Because the owner is required to maintain a 25 percent margin, the owner is required to have $15 (.25×$60) in equity. The owner has only $10 equity, so a margin call for $5 will be made to the owner. If the owner fails to provide the additional funds, the stock will be sold to pay off the loan.

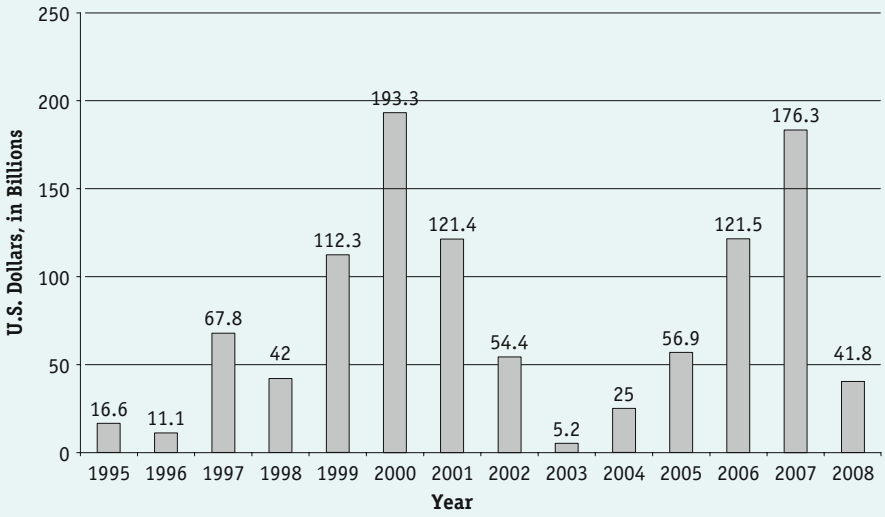
In a falling stock market, buying on the margin can present problems. As noted earlier, if the value of a stock falls to where the lender will put in a margin call that requires the investor to put up more funds, and if the investor fails to do so, the stock is sold at the low price so the lender can recoup part or all of its losses. The selling of the stock to recoup losses puts additional downward pressure on the flagging stock price.

In late 1999 and early 2000, margin credit grew much faster than the overall appreciation of the stock market. By early 2000, margin credit relative to the total value of stocks traded in the market reached a 29-year high. Raising margin requirements has also been proposed as a monetary policy tool to reduce speculative behavior that could fuel a stock market bubble, but the Fed did not choose to exercise this option in the bull market of the late 1990s. It is interesting to consider the similarity with the real estate bubble of 2003–2007, when lower required down payments and increased willingness by borrowers to assume debt and lenders to issue debt fueled price increases.

U.S. markets in the mid- to late 1990s also experienced unprecedented capital inflows to purchase U.S. equities. The magnitude of these inflows is dramatic and is part of the ongoing globalization of financial markets. Exhibit 13-3 shows the dollar value of net non-U.S. purchases of U.S. stocks since 1995.

Only life insurance companies and mutual funds purchased more U.S. equities than did non-U.S. purchasers. The inflows that many attributed to booming U.S. markets also contributed to those booming markets by increasing the demand for stocks. Without the inflow from abroad, demand for U.S. stocks would have been lower and equity prices not as high. Thus, it is difficult to say whether the inflows are the result of booming stock prices or if the inflows caused stock prices to boom. If foreigners sell U.S. equities or slow purchases, prices of U.S. equities will be lower than they otherwise would have been. Indeed, as Exhibit 13-3 shows, foreign purchases of U.S. equities

13-3
Net Non-U.S. Purchases of U.S. Stocks



Year	Billions of Dollars
1995	16.6
1996	11.1
1997	67.8
1998	42
1999	112.3
2000	193.3
2001	121.4
2002	54.4
2003	5.2
2004	25
2005	56.9
2006	121.5
2007	176.3
2008*	41.8

*2008 Annualized through September 30, 2008.

Sources: *Flow of Funds of the United States, Z.1,* Board of Governors of the Federal Reserve System, various issues (September 15, 2000; September 9, 2003; and December 11, 2008).

A Closer Look

Private Equity Funds

Private equity funds have historically been a major source of funding for start-up companies and for firms that are in financial distress. Private equity funds are investment companies that buy publicly held companies and convert them to private ownership—usually through a limited partnership. Although the market for private equity started in the 1960s, it exploded by the middle of the first decade of the 2000s. This represents a significant change in the way corporations are owned. Private equity firms avoid the disclosure regulations that publicly traded firms face. They also avoid the accounting regulations put on publicly traded firms by the Sarbanes-Oxley legislation following the corporate scandal of the early 2000s. Some of the better known companies that have been bought or are in the process of being bought are Chrysler, Dunkin' Brands (owners of Dunkin' Donuts, Baskin-Robbins, and Togo's), Toys "R" Us, Hertz, Neiman Marcus, Univision, Qantas Airlines, Clear Channel Communications, Bausch & Lomb, Harrah's Entertainment, and Albertsons.

Sometimes, private equity firms buy a publicly traded company and then change its management in the hope of going public for large profits in a few years. Some critics point out that, in certain cases, private equity buyouts result in a loss of jobs for the company's workers. Ironically, pension plans are large investors in private equity firms. How private equity firms will weather the ongoing financial crisis remains to be seen.

slowed from $193.3 billion to $5.2 billion over the 2000 to 2003 period. But in 2004, this downward trend reversed, with net foreign purchases of U.S. equities increasing to $121.5 billion in 2006, $176.3 billion for 2007. For the first three quarters of 2008, net foreign purchases of U.S. equities dropped to an annualized rate of $41.8 billion. Net foreign purchases of U.S. equities, although remaining positive, continued to drop through the end of 2008. In the first half of 2009, the flow again began to increase, and increased significantly to over $114 billion in the second quarter alone.

The New York Stock Exchange

New York Stock Exchange (NYSE)
The world's largest market for trading stocks; trades the stocks of more than 2,800 companies.

The **New York Stock Exchange (NYSE),** located on Wall Street in New York City, is the world's largest market for trading securities. As of February 2008, the stocks of 2,805 companies were traded on the NYSE, including 419 non-U.S. companies—up from only 95 foreign companies in 1990. To list its stock on the NYSE, the corporation must apply to the exchange and meet several criteria dealing with the size and number of shareholders. The NYSE seeks to enhance trading by ensuring that markets for any traded stock are sufficiently broad and deep, that is, there are a large number of different securities traded with a large volume of each.

In recent years there have been a number of mergers of different financial markets or *bourses.* Globalized markets, improved electronic means of trading, and the benefits of known and trusted "brand name" exchanges have all supported this general trend. The

NYSE has been a major player in these consolidations. The following is a list of recent changes that have transformed the NYSE, America's and the world's largest exchange:

- 12/15/05—NYSE Hybrid Market is launched, combining traditional auction and electronic trading.
- 12/30/05—The sale of permanent seats on the NYSE ends.
- 3/7/06—NYSE and ArcaEx (Archipelago Exchange), an online securities exchange used for trading both stocks and options, merge. ArcaEx became NYSE Arca.
- 7/17/06—NYSE Group acquires MatchPoint Trading, Inc., a financial services technology company specializing in call market trading and technologies.
- 9/18/06—NYSE Group buys an ownership stake in Marco Polo Network, an electronic platform for trading equities and derivatives listed on emerging market exchanges.
- 4/4/07—NYSE Group, Inc., and Euronext N.V. merge to form NYSE Euronext. Euronext had itself been previously formed by the merger of exchanges in Paris, Brussels, Amsterdam, and Lisbon, as well as the London International Financial Futures and Options Exchange (LIFFE). This move combines major marketplaces across Europe and the United States with long histories and established reputations.
- 12/11/07—NYSE opens an office in China, having been the first foreign exchange to receive such approval.
- 10/01/08—NYSE Euronext purchases the American Stock Exchange in order to capture a bigger share of the options and fund-trading businesses.

Although NYSE Euronext has become a huge publicly traded company, it still has a significant regulatory independent body.[4]

Each company whose stock is listed on the NYSE "Big Board" is assigned to a single post where a specialist in that stock manages the auction process. Orders for a specific stock are funneled to the appropriate post. If the post is surrounded by more brokers looking to buy the stock than to sell at the existing price, the stock's price will rise. If the reverse is true, the price will fall. In this way, the forces of supply and demand determine prices.

Designated Order Turnaround System (SuperDOT)
A computer system used for trades of fewer than 3,000 shares on the NYSE.

At the NYSE, orders may be electronically delivered to these trading posts, booths, or handheld computers in several different ways. More than 95 percent of buy or sell orders reach the specialist's workstation directly at the trading post via the **Designated Order Turnaround System ("SuperDOT"),** an electronic order-routing system. After the order has been executed, a report of execution is returned directly to the member

13-4
The Ten Largest Companies (Measured by Market Value) Traded on the Big Board, September 2007

Company Name	Symbol	Market Cap ($ billion)	NYSE Average Daily Volume
Mitsubishi UFJ Financial Group	MTU	$21,861.4	1,929,220
Banco de Chile	BCH	$3,572.9	17,457
Exxon Mobil Corp.	XOM	$502.9	26,807,800
General Electric Co.	GE	$425.5	40,500,900
Unibanco	UBB	$407.6	1,571,630
Total SA	TOT	$347.2	1,958,150
China Mobile	CHL	$337.4	2,595,390
Petrochina Co.	PTR	$325.1	785,178
AT&T, Inc.	T	$255.7	23,467,700
Royal Dutch Shell	RDS-B	$252.9	271,157

Source: **http://www.nyse.com.**

13-5
The Companies That Made Up the Dow as of January 30, 2009

3M Company	International Business Machines Corp.
ALCOA, Inc.	Johnson & Johnson
American Express, Inc.	JPMorgan Chase & Co
AT&T, Inc.	Kraft Foods Inc.
Bank of America Corporation	McDonald's Corp.
Boeing Co.	Merck & Co., Inc.
Caterpillar , Inc.	Microsoft Corp.
Chevron Corp.	Pfizer, Inc.
Citigroup, Inc.	The Coca-Cola Company
E.I. DuPont de Nemours & Co.	The Home Depot, Inc.
ExxonMobil Corp.	The Proctor and Gamble Company
General Electric Co.	United Technologies Corp.
General Motors Corp.	Verizon Communications, Inc.
Hewlett-Packard Co.	Wal-Mart Stores, Inc.
Intel Corp.	Walt Disney Co.

Source: **http://www.nyse.com.** and **www.ccn.money.com**

firm office over the same electronic circuit that brought the order to the trading floor. Larger orders (more than 3,000 shares) are typically represented personally by floor brokers by one of three additional methods: i) Broker Booth Support System (BBSS), a sophisticated computer system used to receive orders on the Trading Floor, connected to specialist posts and broker handheld computers; ii) NYSE e-Broker, a wireless, handheld tool that enables floor brokers to submit and manage quotes and orders, track executions, and speed the flow of information between customers and the point of sale; and iii) NYSE Direct+, a high-speed electronic connection between NYSE member firms and the Exchange, enabling immediate electronic execution of customer orders.

When a new price is reached, this information is sent out over a ticker, a device which provides a constant stream of stock symbols and prices; each symbol consists of three or fewer letters representing the stock of a particular corporation. The ticker continuously posts stock prices electronically on displays in brokerage houses and on computer screens around the world.

On occasion, there have been large daily fluctuations in stock prices. During the week of October 12 to 16, 1987, the Dow Jones Industrial Average, an index of stock prices, fell 250 points. On Monday, October 19, 1987, it fell 508 points, or more than 20 percent. This was not only the largest point drop in history to that date but also by far the largest percentage drop. To give you some idea of its magnitude, the next largest percentage decline occurred on October 28, 1929, when the market fell 12.8 percent near the start of the Great Depression.[5] Although far from the largest percentage drop, the largest point drop to date in the Dow Jones Industrial average occurred on September 29, 2008 when the average fell 777 points in the ongoing financial crisis of 2008. Late 2008 was characterized by incredibly large swings in stock markets as the economy tried to work its way through the worst financial crisis since the Great Depression.

Circuit Breakers
Reforms introduced in 1987 on the NYSE to temporarily halt market trading if prices change by a specified amount.

In response to the October 1987 crash, certain reforms were instituted to limit such severe declines. In particular, so-called **circuit breakers** were introduced to temporarily halt market trading if prices fall by a specified amount. During the halt, market makers have a chance to take positions and evaluate new information to provide support for the market. Bargains can be snatched up, stopping the free fall in prices. Originally, the new rules called for trading to be halted for half an hour if the market dropped 250 points from the previous day's close. If the market dropped 400 points, trading was to be halted for one hour.

The circuit breakers that halt all market trading were first tripped on October 24, 1997, as stocks fell in response to the Asian crisis. Shortly thereafter, the point ranges were broadened to 350 and 550 points. At the time, many analysts called for switching to a percentage change system from the point change system because trading halts based on percentage changes would be more meaningful. The Dow had increased so dramatically throughout the 1990s that a 350- or 550-point change was not nearly as significant as when the Dow was at lower levels.

In response, the NYSE adopted a threshold percentage rule that took effect on April 15, 1998. The point threshold is adjusted quarterly, based on a percentage of the average closing level of the Dow Jones Industrial Average during the previous month, rounded to the nearest 50 points. The thresholds are as follows:

1. If the Dow declines 10 percent from the threshold before 2:00 P.M., the market will close for one hour; between 2:00 and 2:30 P.M., the market will close for 30 minutes; after 2:30 P.M., the 10 percent threshold is removed, and the market will continue trading.
2. If the Dow declines 20 percent from the threshold before 1 P.M., the market will close for two hours; between 1 and 2 P.M., for one hour; after 2 P.M., for the day.
3. If the Dow declines 30 percent at any time, the market will close for the day.

For the first quarter 2009, the 10 percent threshold was a 850-point decline, the 20 percent decline was 1,700 points, and the 30 percent threshold was a 2,600-point decline.

Index-Arbitrage Trading
The purchasing (or selling) of a basket of stocks, usually through program trading, with the simultaneous selling (or purchasing) of a futures agreement in the same basket of securities in order to make a riskless profit (arbitrage) from the price differential between the basket of stocks and the futures agreement.

Circuit breakers also limit a form of program trading called **index-arbitrage trading,** which involves purchasing (or selling) a basket of stocks, usually through program trading, with the simultaneous selling (or purchasing) of a futures agreement in the same basket of securities. Index-arbitrage trading occurs when the price of the basket of stocks and the price of a futures agreement in those stocks diverge enough for someone to make a riskless profit (arbitrage) from buying in one market and selling in another. As you shall see in Chapter 23, spot prices and futures prices are highly correlated, and an arbitrageur can make a riskless profit if price differentials fall out of alignment. NYSE Rule 80A provides for limitations on index-arbitrage trading in any component stock of the S&P 500 Stock Price Index on any day that the Dow Jones Industrial Average advances or declines at least 2 percent from its previous day's closing value.[6] Circuit breakers for index-arbitrage trading are triggered more frequently because of the smaller price change that is needed to trigger the circuit breaker than for those price changes that halt all market activity.

NASDAQ (National Association of Securities Dealers Automated Quotation System)

National Association of Securities Dealers Automated Quotation System (NASDAQ)
An electronic stock market for trading securities. In 2002, it became an investor-owned corporation, completely independent of the National Association of Securities Dealers (NASD), which had founded it in 1971. It lists more companies and trades more shares on average than the NYSE

Formerly referred to as the "over-the-counter market," **NASDAQ** has evolved into a bona fide stock exchange. NASDAQ grew rapidly in the 1990s and 2000s and had become the main rival to the NYSE. Although the market capitalization of the stocks traded on the NYSE far exceeds that of stocks traded on the NASDAQ, the NASDAQ has been growing relatively faster in terms of the number of shares and dollar volume of trading.

Approximately 3,200 firms are listed on the NASDAQ exchange, of which 335 are from outside the United States. NASDAQ lists more companies and on average, trades more shares per day than the NYSE. NASDAQ listed companies have tended to be disproportionately small, young, technology companies in the past, but now a wide variety of firms are listed, including such high-tech giants as Apple Computer and Microsoft.

Historically, while trades on the NYSE took place at a physical location in New York, NASDAQ was used by securities dealers at various locations, only electronically connected. This lack of a central physical location slowed its general acceptance as

a financial market as real as those with trading floors in historic buildings. In 2000, NASDAQ opened the visually high-tech "MarketSite" in Times Square, New York City, but this location is primarily for public relations rather than actual trading.

NASDAQ was founded in 1971 by the National Association of Securities Dealers (NASD), who divested ownership in 2001. Now it is owned and operated by The NASDAQ Stock Market, a publicly traded corporation in its own right.

Until 1987, most NASDAQ trading occurred via the telephone, but during the October 1987 stock market crash, market makers often didn't answer their phones. As a result, an electronic method for dealers to enter their trades was established. The dealers or brokerage firms that make a market in a particular security or securities buy and sell the securities at publicly quoted prices. Unlike the NYSE, each stock has multiple market makers. The NASDAQ prides itself on its ability to objectively facilitate rapid trades with small transactions costs.

NASDAQ has been actively combining with other exchanges and has used its technological expertise to extend its international reach. In 1992, it joined with the London Stock Exchange to form the first intercontinental linkage of securities markets. More recently, in late 2007, it purchased old, established, but small regional exchanges in Philadelphia and Boston, and in early 2008, it was in the process of forming a strategic alliance with the large and dynamic Middle Eastern exchange Bourse Dubai Ltd. Although mergers have reduced the number of exchanges, competition between NASDAQ and the NYSE seems to be spurring each to lower fees, introduce new technology, and become more international.

Other Exchanges

American Stock Exchange (AMEX)
An historically important stock exchange located in New York City, recently merged with NASDAQ. It currently handles about 10 percent of all securities trades in the U.S. and is relatively important in small-cap stocks and exchange-traded funds (ETFs).

Over-the-Counter (OTC) Market
A network of securities dealers that trades stocks of companies not listed on an official exchange such as NASDAQ or the NYSE.

Historically, there were three nationally important stock exchanges, the NYSE, **American Stock Exchange (AMEX),** and **Over-the-Counter (OTC) Market.** The emergence of NASDAQ from the OTC market placed AMEX at a disadvantage. The NASDAQ merged with AMEX in 1998, but then sold AMEX to private investors in 2003.[7] In October 2008, NYSE Euronext purchased the AMEX, primarily for their expertise in futures trading and Exchange-Traded Funds (ETFs), and their presence in stock options trading.

Many regional stock exchanges in cities such as San Francisco, Boston, Philadelphia, and Chicago traded shares of companies listed on the national exchanges. Nearly all have been absorbed by the two remaining national stock markets, either directly or indirectly. For example, the San Francisco and Los Angeles stock exchanges merged in 1937 to form the Pacific Stock Exchange. This was purchased by Archipelago Exchange (ArcaEx), a vibrant and growing electronic exchange, in 2005. In 2006, ArcaEx was purchased by the NYSE in order to help it better compete with NASDAQ. In late 2007, NASDAQ first purchased the Boston Stock Exchange and, shortly thereafter, purchased the oldest U.S. stock market, Philadelphia. The only exchanges remaining other than the NYSE and NASDAQ tend to specialize in areas other than stocks. For example, the CME Group—formed from the 2007 merger of the Chicago Mercantile Exchange (CME) and the Chicago Board of Trade (CBOT)—specializes in futures contracts, while the New York Mercantile Exchange, Inc. (NYMEX) specializes in trading physical commodity futures, energy, and precious metals.

Many foreign countries also have stock exchanges with varying degrees of development and depth. Some European exchanges, such as the London Stock Exchange and Amsterdam Stock Exchange, predate those in the United States. The Nikkei Exchange in Tokyo, the London Stock Exchange, the DAX in Germany, and the Toronto Stock

Exchange in Canada are among the busiest exchanges around the world. In September 2000, the Amsterdam, Brussels, and Paris stock exchanges merged to form the Euronext Exchange, which as mentioned, subsequently merged with the NYSE in 2007. Even more cross-border mergers are expected, particularly in European countries that participate in the Euro. In recent years, many emerging economies have developed stock exchanges concomitant with the globalization of finance and the increase in capital flows. Stocks in smaller, less established firms not listed on either the NYSE or NASDAQ still trade in an over-the-counter manner, but with higher transactions costs and lower liquidity.

Financial Industry Regulatory Authority (FINRA)
A nongovernmental regulator for all securities firms doing business in the United States, overseeing more than 5,000 brokerage firms. It was created in July 2007 through the consolidation of NASD and the member regulation, enforcement, and arbitration functions of the New York Stock Exchange

Consolidation has not been limited to the stock exchange. In July 2007, NASD and the member regulation, enforcement, and arbitration functions of the New York Stock Exchange were combined to form the **Financial Industry Regulatory Authority (FINRA).** FINRA is a nongovernmental regulator for all securities firms doing business in the United States. It oversees over 5,000 brokerage firms, about 172,000 branch offices, and more than 665,000 registered securities representatives and administers the largest dispute resolution forum for investors and registered firms. It also performs market regulation under contract for The NASDAQ Stock Market, the International Securities Exchange, and the Chicago Climate Exchange. FINRA has approximately 3,000 employees and operates from Washington, D.C., and New York, with 15 district offices around the country.

Recap

U.S. and international stock markets have been evolving and adapting at breakneck speed. Adoption of new trading technologies and internationalization have coincided with two fundamental trends: 1) consolidation between and among domestic and global stock exchanges, and 2) the transformation of stock exchange ownership to corporate entities where the exchange is owned by the shareholders of the corporation. Regional exchanges have been absorbed by either the NYSE or NASDAQ, as have new technology-based exchanges such as ArcaEx and the historically important AMEX. At the present time, only the NYSE and NASDAQ remain as significant U.S. stock markets. Each has become internationally integrated and employs the latest trading technology. As stock markets have become investor-owned corporations, the nature of self-regulation has changed. The Financial Industry Regulatory Authority (FINRA) is currently the largest nongovernmental regulator of U.S. securities firms.

Stock Market Indexes

A stock market index measures the overall performance of the stocks included in the index. An index can be used to evaluate how well a specific stock or mutual fund is performing relative to the stocks represented in the index. Almost 100 indexes monitor stock prices. The **Dow Jones Industrial Average (the Dow)** measures movements in the stock prices of 30 of the largest companies in the country. The Dow, first introduced in 1896, is the oldest index in use today and is probably the most famous. The stocks in an index may include all the stocks traded on a particular stock exchange, selectively picked stocks, or stocks that fall into a particular class based on the value of outstanding shares.

Dow Jones Industrial Average (the Dow)
An index that measures movements in the stock prices of 30 of the largest companies traded on the NYSE.

The following list describes the major stock indexes reported in the popular media. As a quick glance shows, other indexes are far more broadly based than the Dow. Over the long run, however, the movement of the Dow has closely paralleled other more comprehensive indexes.

- The Dow Jones Industrial Average (the Dow or DJIA, for short) is an unweighted average of the sum of the daily closing prices of the stocks of 30 of the largest companies in the country, the "blue chips." The companies that make up the index are selected by Dow Jones & Company, which also publishes *The Wall Street Journal*. The companies are changed over time to reflect changes in corporate America. The 30 companies included in the index as of late 2009 are listed in Exhibit 13-5 (p. 310). Note that the index is larger than the sum of the daily closing prices of the 30 stocks. The number that the sum is divided by is adjusted to account for the effect of stock splits and stock dividends. Also, when one company is dropped and a new company added, the average is adjusted so that the new index is comparable to earlier values.
- The Dow Jones Transportation Average is calculated using the prices of 20 airline, trucking, and railroad stocks.
- The Dow Jones Utility Average is calculated using the prices of 15 gas, electric, and power company stocks.
- The Dow Jones 65 Composite Index is calculated from all stocks in the Dow Jones Industrial, Transportation, and Utility Averages.
- The Standard and Poor's 500 (the S&P 500 for short) is a weighted index of prices of 500 broad-based corporations. Stocks included in the index may be traded on the New York Stock Exchange (NYSE), the American Stock Exchange, or over the counter. They are selected by Standard and Poor's Corporation and changed over time as needed so that the index reflects general stock market conditions. As with other weighted

13-6
The Value of the DJIA, S&P 500, NYSE Composite, and NASDAQ (1985 through 2008)
Billions of Dollars

	Dow Jones Industrial	S&P 500	NASDAQ Composite
1985	1,546.67	211.28	324.93
1986	1,895.95	242.17	348.83
1987	1,938.83	247.08	330.47
1988	2,168.57	277.72	381.38
1989	2,753.20	353.40	454.82
1990	2,633.66	330.22	373.84
1991	3,168.83	417.09	586.34
1992	3,301.11	435.71	676.95
1993	3,754.09	466.45	776.80
1994	3,834.44	459.27	751.96
1995	5,117.12	615.93	1,052.13
1996	6,448.27	740.74	1,291.03
1997	7,908.25	970.43	1,570.35
1998	9,181.43	1,229.23	2,192.69
1999	11,497.12	1,469.25	4,069.31
2000	10,786.90	1,320.28	2,470.53
2001	10,021.50	1,148.08	1,950.40
2002	8,341.63	879.82	1,335.52
2003	10,453.90	1,111.92	2,003.37
2004	10,783.01	1,211.92	2,175.44
2005	10,717.50	1,248.29	2,205.32
2006	12,463.10	1,418.03	2,415.29
2007	13,264.82	1,468.36	2,652.28
2008*	8,776.39	903.25	1,577.03

Source: Global Financial Data, Los Angeles, California.

indexes, the S&P 500 weights the stocks according to their relative values so that larger corporations contribute more to the index. Many analysts consider the S&P 500 to be a more meaningful index of overall stock market activity than the Dow.

- The New York Composite Index is a weighted average of the market value of all stocks traded on the NYSE. The index also reports four subgroup indexes representing industrial, transportation, utility, and finance stocks.
- The Wilshire Equity Index Value (the Wilshire 5000) is a weighted index of the value of all stocks listed on the NYSE, all stocks on the American Stock Exchange, and all over-the-counter stocks that are traded by NASDAQ members. As such, it includes virtually all companies in the United States and is the broadest measure of stock market activity. Today, the Wilshire 5000 includes over 6,800 stocks. When the index was originally created, it included 5,000 stocks (hence the name).
- The NASDAQ Composite Index, as its name suggests, is a weighted index that measures changes in prices of all stock traded by the NASDAQ system.

Exhibit 13-6 reports the value of the DJIA, the S&P 500, and the NASDAQ Composite from 1985 through 2008. Note the phenomenal increase in all of the indices. Exhibit 13-7 includes the daily averages of the stock market volume and the values

13-7
Daily Average of Stock Market Volume and Values Traded (1985 through 2008)

	Stock Market Volume (Daily Average, Millions of Shares)		Value Traded (Daily Average, Billions of Dollars)	
	NYSE	NASDAQ	NYSE	NASDAQ
1985	109.2	82.1	3.9	0.9
1986	141	113.6	5.4	1.5
1987	188.9	149.8	7.4	2
1988	161.5	122.8	5.4	1.4
1989	165.5	133.1	6.1	1.7
1990	156.8	131.9	5.2	1.8
1991	178.9	163.3	6	2.7
1992	202.3	190.8	6.9	3.5
1993	264.5	263	9	5.3
1994	291.4	295.1	9.7	5.8
1995	346.1	401.4	12.2	9.5
1996	412	543.7	16	13
1997	526.9	647.8	22.8	17.7
1998	673.6	801.7	29	22.9
1999	808.9	1,081.80	35.5	43.7
2000	1,041.60	1,757.00	43.9	80.9
2001	1,240.00	1,900.10	42.3	44.1
2002	1,441.00	1,752.80	40.9	28.8
2003	1,398.40	1,685.50	38.5	28
2004	1,456.70	1,801.30	46.1	34.6
2005	1,602.20	1,778.50	56.1	39.5
2006	1,826.70	2,001.90	68.3	46.5
2007	2,110.9	2,132.0	86.8	60.0
2008	2,609.4	2,259.3	82.4	59.4

Source: Securities Industry Association.

traded from 1985 through 2008. Again, note the phenomenal increase in both the volume and value of stocks traded. In the next section, we look at stock markets and mutual funds.

The Stock Market and Mutual Funds

Mutual funds are companies that pool the funds of many investors and then invest in several hundred or even thousands of stocks. In addition, some mutual funds invest in bonds or some combination of both stocks and bonds. The small investor who buys into the fund can own a small piece of the large basket of stocks and/or bonds. As we will see in Chapter 20, any individual can tap into the higher returns of the stock market while minimizing the risk of doing so by purchasing shares of a mutual fund.

For many investors, mutual funds may offer less risk and greater safety than individual stocks because of diversification. Because all securities do not perform equally well over the business cycle (returns are not perfectly correlated), diversification reduces risk. This greatly reduces the consequences of investing in a single company that fails (putting all of your eggs in one basket). If a mutual fund has invested in 1,000 companies, the risk that all of them will go under at once is much less than the risk that any one of them will be forced into bankruptcy. If only one or a few of the companies perform poorly, the overall returns to the mutual fund are hardly affected. Mutual fund companies offer highly trained professional management to research the best investments. This not only saves the individual investor time and effort but also is intended to improve the performance (yield) of the portfolio. No-load mutual funds are bought directly from the mutual fund company and do not involve a brokerage commission.

Indexed Mutual Funds
A mutual fund that holds the same basket of securities that are represented in an index such as the S&P 500 or the Wilshire 5000, so that the investor receives roughly the same return as the index to which the fund is tied.

Indexed mutual funds hold the same basket of securities that are represented in an index such as the S&P 500 or the Wilshire 5000. The investor receives roughly the same return as that of the index to which the fund is tied. For example, if an index appreciates 10 percent, a mutual fund holding the same stocks as in the index also appreciates 10 percent. Indexed mutual funds usually have relatively low costs because little trading occurs. Management fees are low because the mutual fund's holdings do not have to be actively managed. For investors who are satisfied with the return of the overall market, these funds may be a good bet because of their low costs. Often, actively managed funds earn lower returns than the indexed funds and involve significantly higher management fees and other costs.

Exchange-Traded Funds (ETFs)
A security created by a securities firm depositing into a fund that mirrors the holdings of stocks in an index.

In 1993, an alternative investment to indexed mutual funds called exchange-traded funds was developed. **Exchange-traded funds (ETFs)** are shares of a security (such as shares of stock) that mirror the holdings and, hence, the performance of an index. ETFs result from the deposit by a securities firm of a large basket of stocks into a fund that reflects the holdings of the index. The securities firm then receives a block of ETF shares against the basket of stocks. The shares are then offered to individual investors. Because the shares mirror the holdings of stocks in an index, they offer approximately the same return (appreciation or depreciation) that the index does. In the last few years, a series of ETFs have been introduced that do not merely track an index, but track a function of the underlying index, for example following the index multiplied by two, or even negative one. Owning an ETF is like owning a share of stock rather than shares in a mutual fund. ETFs are traded on several exchanges and can be bought and sold through a broker anytime during the exchange hours for their trading price at that particular moment. When mutual funds are traded, they are bought or sold at end-of-day prices. Unlike mutual funds, ETFs can be bought with borrowed funds (margin buy-

ing) and sold short. Limit orders can also be placed. The dollar value of ETFs, which go by names such as Diamonds, iShares, Spiders, and Vipers, among others, has increased from their inception in 1993 to over $500 billion in 2007, or nearly half of the total index fund asset base. A disadvantage of ETFs is that a brokerage commission has to be paid to buy or sell them, which is avoided when no-load indexed mutual funds are bought directly. Both indexed mutual funds and ETFs may also have tax advantages for investors over other mutual fund investments.

Recap Stock market indexes measure movements in stock prices. The Dow is an index of 30 of the largest companies in the country. The S&P 500 is a weighted average of 500 broad-based companies and is considered to be a more meaningful index than the Dow. Mutual funds are investment companies that pool the funds of many investors and purchase securities. They allow for much greater diversification than investors could achieve on their own. Mutual funds now offer indexed mutual funds that hold the same basket of stocks as represented in a stock index. ETFs are securities that mirror the holdings of stock in a market index.

THE VALUATION OF STOCKS

Should you buy a particular stock or not? It depends on whether you think it is your most profitable opportunity, given your tolerance for risk. At the present price at which it is trading, is the stock undervalued or overvalued? In this section, we will attempt to shed some light on these questions.

Given some of the material covered in Chapters 5 and 6, you will not be surprised to learn that the price of a share of stock in a firm should equal the present value of the expected future cash flows that the share will generate, where cash flows include both dividends and retained earnings. If we assume that the stock will be held indefinitely into the future (forever), then the current price of the stock will be equal to the present value of the expected cash flows, as portrayed in Equation 13-1.

$$P = C_1/(1+d) + C_2/(1+d)^2 + C_3/(1+d)^3 \cdots \tag{13-1}$$

where C_n is the expected cash flow in the nth year and d the discount factor (interest rate)[8] applied to find the present value or price (P).

If we expect the firm to earn a constant cash flow, ($C_1 = C_2 = C_3 = \ldots$), then Equation 13-1 simplifies to Equation 13-2.

$$P = C/d \tag{13-2}$$

Assuming that we can estimate the expected cash flow (C) and the discount factor (d), we can solve for the current value of a share of the stock. If the stock is trading at a lower price, the savvy investor will buy; if it is trading at a higher price, the investor will sell. If there is agreement about expected cash flows, the stock's price should converge to the value based on that expectation. In the real world, there are often very divergent opinions about future cash flows. That is the reason some people are buying and others are selling at any given moment.

A question that remains is how the discount factor is determined. For any stock, there is a required return needed by investors who purchase the stock. This is the equilibrium return that is based on a risk-free return plus a risk premium associated with owning the stock, as discussed in Chapter 6. The risk-free return is usually measured by the long-term government bond rate.

The risk premium is composed of two parts:

Market Risk Premium
The risk based on historical data that shows how much on average the ownership of stocks pays over a risk-free return.

Firm-Specific Risk Premium
A risk measured by beta that shows the overall sensitivity of the stock's return relative to changes in the entire market.

Beta
A measure of the overall variability of a stock relative to changes in the entire stock market.

Capital Asset Pricing Model
A model that asserts that the value of a share of stock includes a risk-free return, a market risk premium, and a firm-specific risk premium that is based on beta.

- A **market risk premium** based on historical data that shows how much on average the ownership of stocks pays over the risk-free return.
- A **firm-specific risk premium** that is measured by a coefficient called **beta,** which measures the overall sensitivity or variability of the stock's return relative to changes in the entire stock market.[9] Changes in the S&P 500 can serve as a proxy for changes in the whole market. Thus, if on average a 1 percent increase (or decrease) in the S&P 500 results in a 2 percent increase (or decrease) in a particular stock's price, then the beta for this stock is 2. This indicates that the stock in question is riskier than the average stock in the S&P 500 index because its value fluctuates more. On the other hand, if a 1 percent change in the S&P 500 generates a .5 percent change, the beta is .5, and the stock varies less than the S&P 500.

The **capital asset pricing model** uses the preceding analysis to develop a model of the return needed to own a share of stock based on the market and firm-specific risks. According to the capital asset pricing model, the return needed is equal to the risk-free return plus beta multiplied by the market risk premium, as depicted in Equation 13-3.

$$d = R_f + \beta(R_m) \tag{13-3}$$

where d is the discount factor, R_f is the risk-free return, β is beta for this particular stock, and R_m is the market risk premium with which investors must be compensated for owning stocks in general. The discount factor takes into account the risk-free return, the market risk premium, and the firm-specific variance of the return as measured by beta.

In the preceding example, if the risk-free return is 5.5 percent, the market risk factor based on historical data is 4 percent, and beta for this firm is 2, then d is equal to 13.5 percent $[5.5+(2\times4)=5.5+8=13.5]$. The variable d, 13.5 percent, is the discount factor that we will plug into Equation 13-2 to find the present value of a share of the firm's stock. If the expected cash flow is $10 per year, the price of the stock will be $74.07, because $\$10/.135=\$74.07$.

Note that the risk-free return and the market risk premium are the same for all firms while beta is usually different and dependent on the variability of a firm's returns.

The assumption of a constant expected cash flow is rather limiting because—we hope—cash flows will grow over time. If we assume that expected cash flows grow at a constant percent, g, then we can modify Equation 13-2 to take into account this common growth rate. This is done in Equation 13-4:

$$P = C/(d - g) \tag{13-4}$$

where P is the stock price, C is the expected cash flow today, d is the discount factor, and g is the constant growth rate of future expected cash flows.

Thus, modifying the example, if cash flows are expected to grow 5 percent annually ($g=.05$), the new stock price will be $117.65 because $[\$10/(.135 - .05) = \$117.65]$.

In Chapter 6, we considered the efficient markets theory, which laid much of the groundwork for this section. You saw that the prices of stocks and bonds adjust until the average investor is indifferent between stocks or bonds—in other words, until the risk-adjusted returns to owning stocks or bonds are equalized. In this section, we have expanded that analysis to consider a market risk of owning stocks versus bonds plus a firm-specific risk as measured by beta. The equilibrium return to owning stocks consists of a risk-free return, a risk premium for owning stock, and a firm-specific premium. Again, if the Fed takes action that causes interest rates to change, this changes

Could U.S. Stock Prices Be Justified?

As shown in Exhibit 13-6, by the end of the 1990s, U.S. stock prices as measured by indices had reached levels that would have been unimaginable at the start of the decade. Some analysts believe that the market had been in an irrational bubble that could not be sustained and look to the downturn in the early 2000s to support their claim. Others believe that the record increases were justified. They say that increases in information technologies have transformed the way firms do business, have increased worker productivity, and have promised increased cash flows that justified the high prices. Again, between 2002 and 2007, stock prices had almost doubled. After peaking in July 2007, the stock market fell over 35 percent by October 2008 in response to the global credit crisis. Were stock prices too high in 2007 and 1999, or too low in 2002 and 2008?

Although a definitive answer has not been found, several theories have been put forth that attempt to explain the relatively high stock valuations in 1999 and 2007. From the material in this chapter, we can see that the abnormally high stock prices could be justified under either or both of two conditions:

- first, if expected cash flows increased sufficiently to justify the high prices, and
- second, if the rate at which expected cash flows are discounted decreased enough to justify the high prices.

One theory holds that the high prices were justified if the growth rate of earnings increased from the 1.4 percent average over the past century to 2.4 percent in recent years and if the required rate of return fell from the 7.3 percent average over the last century to 6.6 percent.[a] This theory suggests that changes in stock market participation, consumer preferences, and earnings growth together could explain the higher prices. As noted elsewhere, a much larger percent of the population now participates in the market. Given increased life expectancies and uncertainty surrounding future social security payments, investors now have a longer time horizon for investments. Finally, given the growth of mutual funds, cash flows are less uncertain because of the greater extent of diversification that investing in mutual funds makes possible.

Another theory suggests that the high stock prices could be accounted for because of increases in productivity.[b] For example, productivity increased at an 8 percent annual rate in the 1960s, 2 percent in the 1970s, and 17 percent in the 1990s. Although many believe that the explosion of information technologies has increased worker productivity, these estimates seem unrealistic at best. They also raise another question. If volatile productivity growth can explain changes in stock prices, what are the factors that cause productivity growth to be so volatile?

A third theory is that a major technological innovation reduced the value of existing firms and caused a reduction in the stock market that continued until shares in new firms that make use of the technology make their way into the market.[c] The idea is that the information technology revolution began in the early 1970s with the invention of the microprocessor. However, older firms with existing technologies and capital were slow to adopt the changes and, hence, their values were reduced. The higher value of the new innovative firms was not reflected in stock markets because

they did not offer tradable securities. Only after the new firms issued tradable stocks via IPOs would the value of new technologies be reflected in the market. To support the hypothesis, the authors show that most of the increased values in the stock market relative to gross domestic product since 1985 are the result of increases in the value of new firms. Firms that were already in existence by the early 1970s lost about half of their value in the early 1970s and have not fully recovered.

Finally, a fourth theory suggests that the run-up in stock prices was due to two factors:

- technological changes that were being assimilated into stock valuations, and
- structural changes such as financial liberalization that allowed for more widespread participation in stock markets.[d]

Both of these factors may help to explain the run-up in stock prices. In addition, there are learning curves for both the changes in technology and the increased participation that could help to explain market volatility.

In the bull market and new economy of the late 1990s, Internet stocks—referred to as dot-coms—experienced enormous gains. Some of these start-up companies had never made a profit, had never produced a product, and had virtually no real or financial assets. Then why were investors willing to pay such hefty prices? If you followed this chapter, you should be quick to answer: expected future cash flows. Of course, after spring 2000, when prices of many of the dot-coms collapsed, investors began to take a closer look and question whether or not the expected cash flows had been vastly overestimated. Perhaps some Internet stocks had been caught in a speculative bubble.

Other stocks that suffered significant losses at the time included media and telecommunications stocks. Indeed, the technology-laden NASDAQ index fell about 72 percent from February 2000 to February 2003 in the worst bear market in history.

Technology leaders such as Google and Apple, oil companies and other energy producers, along with financial firms led stock prices higher from 2003 to 2007. Time will tell if prices of these stocks were also pushed up beyond a sustainable, justifiable level.

Endnotes

a. John Heaton and Deborah Lucas, (1999), "Stock Prices and Fundamentals," *NBER Macroeconomics Annual*, 1999, 14(2), p. 213.
b. Robert E. Hall, (2000), "The Stock Market and Capital Accumulation," National Bureau of Economic Research (NBER), Working Paper 7180.
c. Bart Hobijn and Boyan Jovanovic, "The Information Technology Revolution and the Stock Market: Preliminary Evidence," Mimeo (New York University, 2000); and Boyan Jovanovic and Peter L. Rousseau, "Vintage Organization Capital," Mimeo (New York University, 2000).
d. Joseph Zeira, "Informational Overshooting, Booms, and Crashes," *Journal of Monetary Economics* 43, no. 1 (1999): 237–57.

the risk-free return of government bonds, and the financial prices of stocks and bonds adjust until the investor is again indifferent between stocks and bonds.

A point needs to be emphasized: future cash flows are, of course, unknown; therefore, it is the discounted value of expected cash flows that is used in stock valuation. You can see why cash flow and earnings reports get so much attention in the media. If

earnings reports differ from what was forecasted, sharp price movements can occur immediately as investors take advantage of buying and selling opportunities. "Looking Back" on p. 319 discusses some of the current issues with regard to the performance of U.S. stock markets in recent years.

Recap The value of a stock is the discounted present value of the expected future stream of cash flows that the stock will generate. Investors require a return that is the sum of a risk-free return plus a risk premium to account for the fact that stocks are riskier than government securities. In addition to a market risk premium, there is a firm-specific risk premium based on beta that measures the variability of a stock's return relative to the entire market. If cash flows grow by a constant percent, g, the price of a share of stock will be equal to $C/(d-g)$, where C is the original cash flow, d is the discount factor based on the market and firm-specific risks, and g is the constant growth rate of the cash flow.

We have completed our look at stocks. We hope you have a better understanding of these financial instruments. This chapter contains an appendix on how a firm that wishes to raise long-term financial capital chooses between issuing stocks or bonds. In the next chapter, we will examine the mortgage markets.

Summary of Major Points

1. In recent decades, prices of stocks have become more volatile. The Fed is concerned about this because of the potential for stock price bubbles and crashes to cause unemployment or inflation, or to affect the solvency of financial institutions and the financial system.
2. Stocks represent ownership in a corporation. Preferred stock pays a fixed dividend, and common stock may pay a variable or no dividend. Under normal circumstances, publicly held stocks are liquid financial assets that may be traded in organized markets such as the NYSE or NASDAQ. They may also be traded over the counter through computer networks and via telephone transactions.
3. Institutional investors in the stock market are primarily insurance companies, pension plans, and mutual funds. Program trading allows institutional investors to preprogram computers to buy or sell a market basket of stocks. Buying on the margin refers to buying stocks by using one's own funds and borrowed funds. At the present time, margin requirements for purchases are 50 percent. Exchanges set maintenance margins that must be maintained after the stock has been purchased. Shelf registration allows a corporation to register stocks that it can issue over the next two years.
4. The NYSE operates auction-type markets on which a specialist trades large blocks of shares at a specific post. Most smaller trades are made on the NYSE via the SuperDOT system, which is a computer system that sends buy or sell orders to the specialist's post.
5. After a wave of mergers and consolidation, two large international stock exchanges remain, the NYSE and NASDAQ. Both have responded to technological advances and increased globalization by merging with other exchanges, both small regional exchanges within the U.S. and large integrated exchanges in different countries. And both evolved from mutual ownership form to corporate form with publicly traded stock. The form of

regulation has changed as well, with the creation of Financial Industry Regulatory Authority (FINRA) from the consolidation of the regulation, enforcement, and arbitration functions of the New York Stock Exchange with the NASD. Some trading between larger institutional investors, or in stocks of small corporations not listed by the NYSE or NASDAQ, still takes place on an over-the-counter basis.

6. Stock market indexes measure movements in stock prices. The Dow is an index of 30 of the largest companies in the country. The S&P 500 is a weighted average of 500 broad-based companies and is considered to be a more meaningful index than the Dow. Mutual funds are investment companies that pool the funds of many investors and purchase securities, allowing greater diversification for small investors. Indexed mutual funds hold the same basket of stocks as represented in a stock index. ETFs are securities that mirror the holdings of stock in a market index and offer the same advantages of investing in individual stocks.
7. The value of a share of stock is the discounted present value of the expected future cash flows that the stock will generate. Investors require a return that is the sum of a risk-free return plus a risk premium to account for the fact that stocks are riskier than government securities. In addition to a market risk premium, there is a firm-specific risk premium based on beta that measures the variability of this stock's return relative to the entire market. If cash flows grow by a constant percent, the price of a share of stock will be equal to $C/(d - g)$, where C is the original cash flow, d is the discount factor based on the market and firm-specific risks, and g is the constant growth rate of the cash flows.
8. If firms want to spend more than their receipts, they must decide between internal or external financing. If the firm uses external financing, it can issue new stocks or bonds. If a firm chooses external debt financing, it must also decide whether the debt will be long term or short term. Issuing stock dilutes the ownership of the firm. Issuing debt has tax advantages because interest payments are a tax write-off, whereas dividend payments are not. Issuing debt increases the firm's leverage ratio, which makes the firm more vulnerable to a downturn in profits. (See Appendix 13A.)

Key Terms

American Stock Exchange (AMEX), p. **312**
Beta, p. **318**
Capital Asset Pricing Model, p. **318**
Circuit Breakers, p. **310**
Common Stock, p. **301**
Designated Order Turnaround System (SuperDOT), p. **309**
Dow Jones Industrial Average (the Dow), p. **313**
Exchange-Traded Funds (ETFs), p. **316**
External Financing, p. **325**
Financial Industry Regulatory Authority (FINRA), p. **313**
Firm-Specific Risk Premium, p. **318**
Index-Arbitrage Trading, p. **311**
Indexed Mutual Funds, p. **316**
Initial Public Offering (IPO), p. **321**
Internal Financing, p. **325**
Leverage Ratio, p. **326**
Maintenance Margin Requirement, p. **306**
Margin Requirement, p. **305**
Market Risk Premium, p. **318**
National Association of Securities Dealers Automated Quotation System (NASDAQ), p. **311**
New York Stock Exchange (NYSE), p. **308**
Over-the-Counter (OTC) Market, p. **312**
Preferred Stock, p. **301**
Program Trading, p. **305**
Secondary Stock Offering, p. **303**
Securities and Exchange Commission (SEC), p. **302**
Shelf Registration, p. **304**
Speculative Bubble, p. **298**

Review Questions

1. How could a stock market crash affect the economy?
2. Assuming that other factors remain constant, is common or preferred stock riskier to hold?
3. Assuming that other factors remain constant, which pays a higher return to the stockholder: common or preferred stock?
4. To which market index would you refer to see how well the stock market is performing? Why? Why do you think the movements of the Dow and the S&P 500 are highly correlated?
5. Why are mutual funds generally perceived to be less risky than holding a market basket of individual stocks?
6. What are institutional investors, and what impact do they have on stock markets? What is program trading?
7. Who currently owns the NYSE and NASDAQ? How has the ownership structure changed over time?
8. Are firms listed on the NYSE "big board" always larger than firms listed only by NASDAQ?
9. What are circuit breakers? How have the rules affecting them changed in recent years?
10. What is program trading? What is index-arbitrage trading?
11. How has the NYSE responded to the technological challenge posed by NASDAQ and the trend toward more global financial markets?
12. In a paragraph, explain how inflation in stock markets can spill over to inflation in output markets. Do the same for deflation.
13. What is buying on the margin? Does it increase or decrease the risk of large losses? What about gains?
14. Can newly issued Microsoft stock be offered in an IPO? Explain. What is the difference between buying stock in a secondary public offering or in the secondary market?
15. What are the differences between indexed mutual funds and ETFs?
16. How does a firm choose between debt and equity financing? What are the advantages and disadvantages of each? (See Appendix 13A.)

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

✓17. If a share of stock pays a dividend of $3 and closes today at $36, what is the current yield?

✓18. What is the discount factor if beta is 1.2, the market risk premium is 5 percent, and the risk-free return is 4 percent?

✓19. If the expected cash flow is constant and equal to $10, what is the value of a share of stock with the discount factor in problem 18? If the cash flow is expected to grow 3 percent each year, what is the value?

✓20. If I bought $10,000 worth of stock by putting up 60 percent of the selling price and borrowing the rest, how much have I borrowed? If the stock falls to $3,000 and a margin call is put in for the difference between the value of the stock and the amount I have borrowed, how much will I have to put up?

✓21. New earnings figures suggest that cash flows will experience a $100 onetime increase because of a new product being brought online. If d is 15 percent and g is 3 percent, how much will the stock's value increase?

✓23. Jessie bought a share of stock for $100. She borrowed $50 from her broker. There is a 25 percent maintenance margin requirement established by the brokerage firm she does business with. The price of the stock falls to $80. Will her broker put in a margin call to her, asking her to put up more funds? If so, how much more? What if the price falls to $50? In each case, if so, how much more?

Suggested Readings

To access closing prices, number and dollar value of shares traded, as well as other information on NYSE-listed companies, search the exchange's database at **http://www.nyse.com.**

"A Guide to the NYSE Marketplace," published in June 2006, provides a great introduction to the New York Stock Exchange and stock trading in general. It is available online at **http://www.nyse.com/pdfs/nyse_bluebook.pdf.**

For a brief introduction to the NASDAQ, see the "NASDAQ Fact Sheet 2008," available online at **http://www.nasdaq.com/about/2008_Corporate_FS.pdf.**

To see how the founder of the Vanguard Group, Inc., John Bogel, feels about Exchange-Traded Funds (EFTs), see "What's Wrong with ETFs?" *Business Week*, April 30, 2007.

Partially in order to support the stock market, the Fed reduced its interest rate target by 1.25 percent within an eight-day period in early 2008. To see how these actions were viewed at the time, see "Desperate Measures" in *The Economist*, January 22, 2008.

For an interesting look at the stock market in the 1990s, see Maggie Mahar, *Bull! A History of the Boom, 1982–1999* (New York: HarperBusiness, 2004).

For a look at the consequences of the Fed's actions on the stock market, see "What Explains the Stock Market's Reaction to Federal Reserve Policy?" by Ben S. Bernanke and Kenneth N. Kuttner, Board of Governors of the Federal Reserve, Finance and Economics Discussion Series, 2004–16 (March 2004). It is available online at **http://www.federalreserve.gov/pubs/feds/2004/200416/200416pap.pdf.**

"Should the Fed React to the Stock Market?" is the question posed by Kevin J. Lansing in his article by the same name in *The Economic Letter*, Federal Reserve Bank of San Francisco, Number 2003–34 (November 14, 2003).

For a sobering look at the stock market, see J. Patrick Raines and Charles G. Leathers, *Economists and the Stock Market: Speculative Theories of Stock Market Fluctuations* (Northampton, MA: Edward Elgar, 2000).

For a discussion of the linkages between asset prices and monetary policy, see "Manias and How to Prevent Them: An Interview with Charles Kindleberger" and "Market Volatility and Monetary Policy," by John Balder, Jr., both in *Challenge* (November–December 1997): 21–31 and 32–52, respectively. Also see "Monetary Policy and Asset Prices," by Andrew J. Filardo, *Economic Review of the Federal Reserve Bank of Kansas City* 85, no. 3 (Third Quarter 2000): 11–38.

Technology has played a part in the formation of numerous stock market bubbles. For an in-depth look at technological innovation and stock market bubbles since the early 1900s, see Robert Shiller's *Irrational Exuberance* (Princeton, NJ: Princeton University Press, 2001).

For a historical look at a time when the New York Stock Exchange nearly collapsed, see Alec Benn, *The Unseen Wall Street, 1969–1975* (Westport, CT: Greenwood Publishing Group, 2000).

For a comprehensive view of the stock market and how it affects the economy, see John Charles Pool and Robert L. Frick, *Demystifying the Stock Market* (Winchester, VA: Durell Institute of Monetary Science at Shenandoah University, 1993).

One of the best resources for a layperson to learn about the stock market is William J. O'Neill, *How to Make Money in Stocks: A Winning System in Good Times or Bad*, 3rd ed. (New York: McGraw-Hill, 2002). Another good book is *One Up on Wall Street: How to Use What You Already Know to Make Money in the Market*, by Peter Lynch and John Rothchild, (New York: Simon and Schuster, 2000).

For a look at "Mutual Funds and the U.S. Equity Market," see the article by the same name by Eric M. Engen and Andreas Lehnert, *Federal Reserve Bulletin* (December 2000): 797–817.

For another point of view, see "The Long-Term Outlook for Stocks: Interview with Peter Diamond," *Challenge* 43, no. 2 (March–April 2000): 6–16.

Appendix 13A: The Choice Between Stocks and Bonds

In the process of investing and operating on a day-to-day basis, firms experience periods when expenditures exceed receipts. As a result, a firm must make several portfolio decisions regarding the financing of excess spending. First, should the spending be financed internally or externally? Internal financing is simply the spending of money balances on hand or the liquidation of financial or real assets owned by the firm to finance the excess. **Internal financing** is the largest source of funds for business firms.

Internal Financing
Spending money balances on hand or liquidating financial or real assets to finance spending that exceeds current receipts.

External Financing
The financing of spending that exceeds current receipts by expanding either debt or equity.

As for **external financing,** there are two types: expanding equity or expanding debt. Thus, if a firm chooses external financing—perhaps because its financing needs exceed the internal funds available—it must then decide whether to issue new debt and/or equity.

External financing via equity involves issuing shares of common stock, thereby expanding the ownership in the firm. If the new shares are sold to existing shareholders, ownership is not diluted. Indeed, existing shareholders are sometimes given the first option to purchase the new shares. If the firm chooses external financing through borrowing, it must decide whether to issue long-term or short-term debt. For example, the firm must choose between loans or market instruments, such as commercial paper and corporate bonds. In general, each decision is guided primarily by the desire for profit maximization and the existing structure of financial liabilities. A firm will choose the option that minimizes the cost of funds.

For each firm, the prevailing financial environment, the stance of monetary policy, and so forth, will determine the overall cost of funds. The relative cost of alternative sources of financial capital and, therefore, the particular financing decision reached by a given firm, will be influenced by several considerations: (1) the particular type of expenditures being financed, (2) the current financial environment and expectations about the future environment, (3) the firm's financial structure, and (4) the tax laws. Traditionally, borrowing to finance inventories has taken the form of either short-term bank loans or the issuance of commercial paper. The usual maturity of the bank loans or commercial paper is one to six months, which is appropriate because inventories are typically not held for long periods of time. Fluctuations in inventory investment over the business cycle explain much of the variation in short-term debt accumulated by firms. The correlation is not perfect, however. For example, if many firms perceive prevailing long-term rates to be temporarily high relative to short-term rates, some firms will issue short-term debt to finance the initial phases of their investment spending on new capital. These firms expect that long-term interest rates will soon drop, at which point the firms will issue long-term debt to pay off the maturing short-term debt and finance subsequent phases of their investment spending. Thus, we see how current and expected financial environments play a role in firms' financing decisions.

From the mid-1970s until 1991, a substantial portion of externally financed investment spending, which by definition is the acquisition of capital (new plant and equipment), was financed by issuing long-term debt. Why long-term debt instead of equity? The answer is that U.S. tax laws tend to bias the financing decisions of business firms toward debt and away from equity. Interest paid on debt is a tax-deductible cost; therefore, it is subtracted from gross revenues before the corporate income tax is computed. Dividends paid to equity holders, however, are not tax deductible. Dividends must be paid from after-tax earnings. Thus, debt financing will initially be cheaper, on average, than equity financing. Equity financing may also entail higher transaction costs when it is initially issued. Additionally, equity financing dilutes the ownership of current shareholders.

Debt financing also has a downside. Increasing debt is believed to expose a firm to more risk and therefore weaken its financial structure. The exposure to more risk can ultimately raise the overall cost of capital because the suppliers of funds require higher returns to compensate them for the additional risk.

Leverage Ratio
The ratio of debt to equity on a firm's balance sheet.

The relationship among debt finance, risk, and the cost of capital is rooted in a common measure of the financial structure—the **leverage ratio,** or the ratio of debt to equity on a firm's balance sheet. Other things being equal, the higher the leverage ratio, the greater the risk to bondholders and stockholders. The reason is that if a highly leveraged firm experiences a substantial decline in earnings, it may default on its debt obligations and be forced into bankruptcy, possibly leaving its stockholders with nothing. A firm with a low leverage ratio could weather a decline in earnings by cutting dividends, which are residual claims, not contractual obligations. The leveraged firm does not have this option: it must pay its debt costs or fold. Hence, ceteris paribus, risk-averse investors will typically demand a higher yield on funds they lend to highly leveraged corporations. Firms that have considerable debt relative to equity will find the cost of debt financing (as well as equity financing) to be relatively high. As a result, they may decide to issue equity both to raise funds and to strengthen their balance sheets.

Another reason that firms issued new debt in the 1980s was to acquire the equities of other firms in whole or in part. Often referred to as mergers and acquisitions, this activity has sometimes been financed by the issuance of junk bonds that carry yields above those prevailing on higher-rated conventional corporate bonds. In this case, debt increases, but no new investment occurs. Whatever the benefits of this activity, the resulting expansion of debt relative to equities increases the leverage ratio of the corporate sector as a whole. This, in turn, generates concerns about increased risk—that is, the increased vulnerability of individual firms and the economy as a whole to adverse developments.

Starting in 1991 and lasting until early 1994, firms altered the trend of debt financing and issued new shares of stock instead. Because of lower interest rates on CDs, savers poured funds into mutual funds that soaked up the new stock issues. With stocks trading at high values, issuing relatively fewer shares could raise large amounts of funds. By mid-1994, the trend had reversed. Companies bought back record amounts of stock, and stock buybacks remained brisk a decade later. Companies were using earnings to purchase their own stock rather than to pay dividends. In the bull market of the late 1990s, this activity was also pushing stock prices even higher.

Endnotes

1. "America Bubbles Over," *The Economist* (April 18–24, 1998): 67.
2. Corporations are legal entities that own the assets of the corporation. Stocks represent ownership of the legal entity rather than ownership of the assets directly.
3. Indeed, in January 2003, Microsoft announced that it would begin paying dividends for the first time.
4. NYSE Regulation, Inc., is a not-for-profit corporation with the official goals of strengthening market integrity and investor protection. NYSE Regulation is a subsidiary of NYSE Euronext and its board of directors, with a majority of directors unaffiliated with any other NYSE board. NYSE Regulation is thus relatively independent in its decision making.
5. Over time, movements in the Dow have been closely correlated with the overall movement of more broadly based stock market indexes.
6. The NYSE has proposed to the SEC that the relevant index should be changed to the NYSE Composite from the DJIA.

7. The NASDAQ purchased the online trading network Instinet in 2006. It then spun out Instinet, LLC as private agency broker, which was then acquired by Nomura Holdings, Inc., in 2007.
8. Terminology is not uniform in this area, with some writers using the term "discount factor" to mean $d = 1/(1+r)$, in which case r would be called the "discount rate." We reserve the term "discount rate" to denote the rate set by the Fed, and use "discount factor" to denote d = "rate of time preference," or the interest rate used to discount future payments.
9. The covariance between two variables is a measure of how the variables move together. The variance of a variable is a measure of how a variable moves relative to its mean. In reality, beta is the covariance between a specific stock's return and the market's return, all divided by the variance of the market's return.
10. Historically, dividends were subject to so-called double taxation. They were taxed as part of business income and taxed again as part of household income. Tax law changes in 2003 reduced taxes on dividend income that households receive.

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CHAPTER FOURTEEN

14

We are the country's third largest corporation, in terms of assets, and the nation's largest provider of funds for home mortgages. With a book of business that currently exceeds 12 million mortgages, we are one of the largest financial services corporations in the world.

—Fannie Mae homepage, www.fanniemae.com, circa 2005

Fannie Mae was established as a federal agency in 1938, and in 1968 we were chartered by Congress as a private shareholder-owned company. On September 6, 2008, Director James Lockhart of the Federal Housing Finance Agency (FHFA) appointed FHFA as conservator of Fannie Mae. In addition, the U.S. Department of the Treasury agreed to provide up to $100 billion of capital as needed to ensure the company continues to provide liquidity to the housing and mortgage markets.

—Fannie Mae homepage, www.fanniemae.com, 2009

The Mortgage Market

Learning Objectives

After reading this chapter, you should know:

What a mortgage is and how the mortgage market functions

How the secondary market in mortgages works and what mortgage-backed securities are

The main risks of investing in mortgages and mortgage-backed securities

How prices of mortgages are determined in secondary markets

The role of the government in the mortgage market

FROM BOOM TO BUST

In the United States, commercial banks, savings and loans, and mortgage brokers have been active participants in the residential mortgage market. The federal government also plays an increasingly important role both directly and indirectly. Ginnie Mae, FHA, and VA are federal agencies that facilitate mortgage lending by insuring the principal and interest payments on some mortgage loans. Fannie Mae and Freddie Mac, two government-sponsored enterprises, were major participants in the secondary mortgage market and were involved in over 50 percent of the $12 trillion of mortgage loans that were outstanding in 2008. In addition, borrowers in the early 2000s had a wide variety of innovative mortgages from which to choose. This availability of credit fostered by the private and government sectors contributed to an unprecedented housing price boom in the early 2000s. Many mortgages were made with low or no down payments, high loan-to-value ratios, low initial "teaser" rates that would reset higher in a few years, little or no income verification, negative amortization, and in some cases, to borrowers with bad credit. Lending standards were reduced to abysmal levels and buyers and lenders got caught up in the belief that housing prices would keep increasing forever. All was good until the housing price bubble burst and prices began to fall in mid-2007.

The crisis spread to other domestic and global financial markets, and in 2008, unprecedented government intervention was desperately trying to pull the economy out of the severe recession brought on by the crisis in the mortgage market. As of this writing, the mortgage market and housing prices have yet to stabilize, and more and more homeowners are finding themselves upside down (owing more than the value of their home) and a wave of foreclosures continues as interest rates on nontraditional loans adjust sharply upward. (Note also from the quote at the beginning of the chapter that Fannie Mae and Freddie Mac were put into conservatorship by the U.S. government in September 2008 because of large losses that made them virtually insolvent.)

In this chapter, we look at the mortgage market, which is the largest debt market in the United States and is currently caught up in a crisis.[1] Residential mortgages, our focus, make up the largest segment of the market. We shall see how the mortgage market has changed in recent years, as well as the role of the government and government-sponsored enterprises in the mortgage market, and the risks and benefits of investing in mortgages. Further change is no doubt on the horizon as policy makers and lenders seek solutions to the current crisis and reforms that will return the market to widespread solvency and safety. We begin with a description of mortgages and how the mortgage market functions.

THE ANATOMY OF MORTGAGES

Collateral
The building (structure) or land that will be foreclosed on and repossessed if the borrower fails to make the scheduled payments; the lender then sells the property to recoup some or all of the losses.

A *mortgage* is a long-term debt instrument for which real estate is used as **collateral** to secure the loan in the event of a default by the borrower. Mortgages are assets to the holder (lender) and liabilities to the issuer (borrower) who signs the mortgage agreement. They are similar to bonds with the caveat that the underlying real property or land serves as collateral.

Mortgages result from loans made to individuals or businesses to purchase land, single- or multiple-family residential housing, commercial properties, or farms. Mortgages may also be made to finance new commercial or residential construction. The building (structure) or land serves as collateral. In general, borrowers put down a minimum of 5 to 20 percent to purchase a property and take out a mortgage loan for the balance of the purchase price.

14-1
The Outstanding Value of Mortgages, 2008** (in billions)

Type of Mortgage	Outstanding Value	Percentage of Total*
Single-family residential	$11,166.8	76
Multi-family residential	$890.4	6
Commercial	$2,552.6	17
Farm	$110.3	1
Total	$14,720.1	100%

**Through third quarter 2008.
Source: Flow of Funds, Z1, Board of Governors of the Federal Reserve System, December 11, 2008, p. 93.

As noted previously, most mortgages are made to individuals to purchase residential property. Thus, households are the major borrowers in this market. Exhibit 14–1 shows the outstanding values of the various types of mortgages. In late 2008, single- and multi-family residential mortgages accounted for 82 percent of all mortgages.

Lien
A public record that stays with the property title and gives the lender the right to repossess and sell the property if the borrower defaults.

With a mortgage loan, the lender puts a **lien** on the property until the mortgage is fully paid off. The lien is a public record that stays with the property title and gives the lender the right to repossess the property if the borrower defaults. In the event of a default, the property is usually sold to recoup some or all of the losses. The property cannot be sold to a third party unless it is free of liens. In this way, the lender is guaranteed that the collateral will be there if the borrower defaults.

Despite the lien on the property that comes with a mortgage, lenders are not in the business of repossessing properties. Therefore, they want to be careful in assessing the **default risk** on a loan. Keeping this in mind, what would a lender want to know to determine whether a borrower should get a mortgage loan?

Default Risk
The risk that the borrower will not make the principal and interest payments as scheduled.

The two most important factors in determining whether a borrower can obtain a mortgage loan are the borrower's debt-to-income ratio and loan-to-value ratio. The debt-to-income ratio measures the monthly payments of the borrower relative to the borrower's monthly income and reflects how easily the borrower can afford to make the monthly payment. For example, if a borrower with an income of $4,000 per month and no other debts is applying for a mortgage with a monthly payment of $1,000, the **debt-to-income** ratio is $1,000/$4,000, or 25 percent. If the same borrower has $300 in other monthly debts, say a $300 monthly car payment, the total debt, including the mortgage, would be $1,300 per month ($1,000 mortgage payment plus $300 car payment). In this case, the debt-to-income ratio would be $1,300/$4,000, or 33.3 percent. If the borrower has credit card payments of $200 per month in addition to the car payment and the proposed mortgage payment, the debt-to-income ratio would be $1,500/$4,000, or 37.5 percent. Thus, the debt-to-income ratio includes not only the new payment on the real estate but also other payments such as car payments, credit card payments, and so forth, for which the borrower is liable. In general, lenders want the debt-to-income ratio to be lower than 36 percent, although with the relaxed standards leading up to the mortgage crisis of 2007–2008, the ratio could be up to 50 percent or more, particularly in cases where there was no income verification. In 2009, lending standards have again been tightened because of the crisis and apparent excessive risk taking that was prevalent in the boom period of 2003 to 2006.

Debt-to-Income Ratio
A ratio composed of all of the borrower's debt relative to income; generally should not exceed 36 percent for a loan to be approved.

Loan-to-Value Ratio
The loan size relative to the value of the property that is used as collateral.

The **loan-to-value** ratio measures the loan size relative to the value of the property that the lender would receive in the event of default. For example, if the purchaser puts down $20,000 and is borrowing $80,000 on a $100,000 property, the loan-to-value

ratio is $80,000/$100,000, or 80 percent. If the purchaser has only $10,000 for a down payment, the loan-to-value ratio would be $90,000/$100,000, or 90 percent. The larger the down payment, the smaller the loan-to-value ratio.

It should come as no surprise that the lower the debt-to-income and loan-to-value ratios are, the easier it is for a borrower to obtain a mortgage loan. A low debt-to-income ratio means that it is easier for the borrower to afford the loan. The larger the down payment, the smaller the amount of the loan. However, loans for 100 percent of the value of a property are sometimes available, particularly when property values are appreciating rapidly. The borrower's credit rating as measured by a credit rating agency is also important in determining whether a mortgage loan will be approved. The credit history becomes less important if is the borrower makes a large down payment relative to the property value. In the later years of the housing boom in 2005 and 2006, lenders were making "zero-down, interest-only loans" and in some cases, lending more than the value of the house with the belief that housing prices would only continue to increase. The borrower pays a higher interest rate to procure such a loan because of the increased risk involved. This too has changed in 2009 in response to the crisis, and such loans are no longer available.

Mortgage Amortization

Amortization
The paying off of the principal of a loan over the life of the loan.

Historically, the repayment of the principal on a mortgage is generally spread out over the life of the loan. Each month, a constant payment is made that includes some part of the principal in addition to the interest payment. At the end of the loan, the mortgage has been fully repaid. This is known as **amortization.**[2] In the early 2000s, leading up to the housing boom, many lenders made interest-only mortgages, whereby for some initial years—say three, five, seven, or ten—only interest payments were made on the loan. This resulted in much lower initial payments because no payments were made to principal in the early years of the loan. At the end of the initial period, payments would rise as both interest and principal payments were made. By 2009, and as a result of the housing bust, interest-only mortgages had virtually disappeared. Mortgages are usually made for up to 30 years. In recent years, though, more shorter-term mortgages have been made in some areas, resulting in interest savings over the life of the loan. The most popular terms are 15 and 30 years.

Exhibit 14–2 shows several months in the amortization schedules for a $200,000 mortgage issued at 8 percent for 15- and 30-year terms. Note that in both cases, a small amount initially goes toward the principal of the loan. Over time, the amount applied to the principal increases. For example, with the 15-year mortgage, $577.97 goes on the principal the first month, $800.40 the 50th month, and $1,898.65 the 180th, or last, month. With the 30-year mortgage, $134.20 goes toward the principal the first month, $185.84 the 50th month, $440.84 the 180th month, and $1,457.81 the 360th, or last, month. The small, initial principal corresponds with a large interest payment. As the principal gradually falls, more of the constant monthly payment goes toward the principal and has a much larger impact on it. Note also that $184,275.74 ($328,310.49 – $144,034.75 = $184,275.74) in interest is saved over the life of the loan if the term is 15 years instead of 30.

Although not apparent in Exhibit 14–2, which uses an 8 percent interest rate for both the 15- and 30-year loans, the interest rate on a 15-year mortgage is usually less than the interest rate on a comparable 30-year mortgage. The longer the term to maturity, the greater the risk that the lender could lose. Thus, a higher interest rate compensates the lender for the longer term. Despite the savings, many individuals opt for the 30-year

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The Amortization Schedule of 15- and 30-Year Mortgages for Selected Months

Principal	$200,000
Interest Rate	8 percent
Amortization Period	15 Years—180 Payments
Monthly Payment	$1,911.30

PAYMENT NUMBER	PRINCIPAL	INTEREST	BALANCE
1	$ 577.97	$ 1,333.33	$199,422.03
2	581.82	1,329.48	198,840.21
3	585.70	1,325.60	198,254.50
4	589.61	1,321.70	197,664.89
49	795.09	1,116.21	166,636.30
50	800.40	1,110.91	165,835.90
110	1,192.47	718.84	106,633.29
180	1,898.65	12.66	0
Total	$200,000.00	$144,034.75	$ 0

Principal	$200.000
Interest Rate	8 percent
Amortization Period	30 Years—360 Total Payments
Monthly Payment	$1,467.53

PAYMENT NUMBER	PRINCIPAL	INTEREST	BALANCE
1	$ 134.20	$ 1,333.33	$199,865.80
2	135.09	1,332.44	199,730.10
3	135.99	1,331.54	199,594.72
4	136.90	1,330.63	199,594.72
49	184.61	1,282.92	192,253.47
50	185.84	1,281.69	192,067.63
110	276.87	1,190.66	178,321.70
180	440.84	1,026.69	153,563.12
240	656.78	810.75	120,955.93
300	978.50	489.03	72,376.24
360	1,457.81	9.72	0
Total	$200,000.00	$328,310.49	$ 0

Federal Housing Administration (FHA)
A federal agency that for a 0.5 percent fee insures mortgage loans made by privately owned financial institutions up to a certain amount if the borrowers meet certain conditions defined by the FHA.

Veterans Administration (VA)
A federal agency that, among other things, insures mortgage loans made by privately owned financial institutions up to a certain amount if the borrowers meet certain conditions, including being military veterans.

mortgage because they cannot afford the higher payments associated with a 15-year mortgage. In the example in Exhibit 14–2, the difference in the monthly payments is $443.77 per month ($1,911.30 – $1,467.53).

Insured and Uninsured Mortgages

Residential mortgages may also be insured by an agency of the federal government. The insurance guarantees the repayment of the principal and interest in the event that the borrower defaults. This eliminates the credit or default risk for the lender. The two federal agencies that guarantee mortgages are the **Federal Housing Administration (FHA)** and the **Veterans Administration (VA).** For a 0.5 percent fee, the FHA insures mortgage loans made by privately owned financial institutions up to a certain amount that varies by state, depending on average housing costs. In 2008, in response to the ongoing crisis in the housing market, the maximum amount in the highest priced areas

was temporarily set at $729,750. The amount was lowered to $625,500 in 2009. Borrowers must meet certain conditions defined by the FHA. Generally, the criteria deal with the income of the borrower; FHA loans are designed to help low-income families purchase homes. With the government guarantee, the lender does not have to worry about the borrower defaulting. VA loans are similar to FHA loans but are designed to insure the principal and interest payments on loans made to veterans. The purpose is to help those who have served the country in the military to purchase homes. FHA and VA loans generally have small or no down payments.

Conventional Mortgages
Mortgages made by financial institutions and mortgage brokers without federal insurance that the principal and interest will be repaid.

Conventional mortgages have no federal insurance and are made by financial institutions and mortgage brokers. These loans usually require a 5 to 20 percent down payment. Generally, when the down payment or equity in the property is less than 20 percent, lenders require the borrower to purchase private mortgage insurance that would make the principal and interest payments in the event the borrower defaults.

The borrower pays a higher interest rate to cover the cost of the insurance. Equity is the difference between the market value of the property and the outstanding loan balance. If the property appreciates enough or if the loan balance declines enough that the equity in the property is 20 percent or greater, the borrower may initiate the termination of the mortgage insurance. In this case, the monthly payment will fall by the amount of the insurance.

Closing Costs

Closing Costs
Costs to obtain a mortgage, the bulk of which are paid by the borrower; they include such things as loan origination fees, surveys, appraisals. credit reports, title insurance, recording fees, and processing fees.

Points
A measure of interest prepayment at the time a mortgage loan is made that lowers the nominal interest rate on the loan; one point is equal to 1 percent of the loan balance.

Mortgages also entail **closing costs** that are paid by the borrower. These costs include loan origination fees, appraisals, property surveys, credit reports, title insurance, recording fees, and processing fees. Title insurance, purchased before the loan closes, guarantees the lender that there are no liens on the property.

Closing fees may also include **points.** One point is equal to 1 percent of the loan balance. For example, on a $150,000 mortgage, one point is $1,500, two points are $3,000, and so on. Points are, in reality, a prepayment of the interest on the loan. The borrower has an option of how many points to pay. The more points paid up front, the lower the interest rate on the loan. The borrower may also choose to pay no points and pay a higher interest rate. The decision as to how many points to pay should be based on how long the borrower anticipates having the loan. Very few loans are kept the full 15- or 30-year term. If the borrower anticipates moving (or refinancing if interest rates fall) in 3 to 5 years, the loan will be paid off (prepaid) long before maturity. In this case, paying points up front may be more costly over the life span of the loan. That is, if points paid up front are figured into the cost of the loan, the effective interest rate can be much higher even though the nominal interest rate is lower than when no points are paid.

Now would be a good time to read the accompanying "Looking Back," "The Evolution of the Mortgage Market."

Looking Back

The Evolution of the Mortgage Market

Prior to the Great Depression, most mortgages were "balloon" mortgages. Only interest payments were made on a monthly basis and the entire principal was due at maturity. They required large down payments that averaged about 40 percent of the property value. At the end of the term (usually three to five years), the mortgage was usually renegotiated for a slightly lower amount. Because of the economic havoc created by the Great Depression, many borrowers could not renegotiate the mortgages and many lenders failed in the early 1930s. The widespread defaults caused the collapse of the mortgage market. The federal government stepped in and assisted homeowners by taking over the balloon payments and allowing borrowers to spread out the payment of both the principal and interest over a longer period of time. Thus, the first amortized mortgages were introduced. In addition, in 1934 the federal government established the FHA to insure the timely payment of principal and interest on long-term, fixed-rate mortgages that met FHA's criteria. In 1944, VA-insured loans, similar to FHA loans, were established that required no down payments for eligible veterans.

In the two decades after World War II, the mortgage market thrived and was dominated by savings and loan associations, which held long-term mortgages funded with short-term deposits. By the late 1960s, an inflationary environment began to cause problems for savings and loans. The need to adjust asset maturities in the face of rising inflation and interest rates underscored the need for a secondary market. With a secondary market, the lender would not have to hold the mortgage until maturity but rather could sell it in the secondary market. Hence, the interest rate risk would be reduced. In 1968, the government established Ginnie Mae and re-chartered Fannie Mae as a privately owned, government-sponsored enterprise (rather than government owned). Advances in computer technology and the emergence of mortgage-backed securities in 1970 fostered the growth of a secondary market.

By the 1980s, mortgage brokers and mortgage bankers were originating many mortgage loans that were then sold off in the secondary market to Fannie Mae, Freddie Mac, and other private issuers of mortgage-backed securities. Mortgage brokers and mortgage bankers originate mortgages but do not hold them as investments. Despite the collapse of the savings and loan industry in the 1980s, mortgage lending continued as other lenders, including commercial banks, stepped in to fill the void.

From 1982 to 2000, the dollar value of outstanding mortgages rose from $1,666.1 billion to $6,959.1 billion, an increase of over 318 percent in nominal terms. During this same period, the consumer price index increased by 74.6 percent, nominal GDP increased about 200 percent, and real GDP increased by just under 89 percent. Thus, outstanding mortgages grew at a much faster rate than the overall level of prices and the levels of real and nominal economic activity.

Two other changes are noteworthy. First, in 1982, savings institutions held over 35 percent of all outstanding mortgages. By 2000, savings institutions held only about 10 percent. Commercial banks that held approximately 18 percent of outstanding mortgages in 1982 increased their share to about 24 percent by 2000. Both types of institutions prefer to hold ARMs because of the reduced interest rate risk.

Second, the biggest mortgage holders today are government-sponsored enterprises. In 1982 they held 23 percent of all mortgages, and by 2000 this percentage had increased to 36 percent. By 2008, Fannie and Freddie owned or insured about half of the $12 trillion in outstanding mortgages and mortgage-backed securities. This does not include the mortgages that are federally insured by Ginnie Mae but held by private institutions. Outside of insuring the timely payment of principal and interest on VA and FHA loans, the federal government did not play an important role in the mortgage market before 1970. With the creation of Ginnie Mae and Freddie Mac, and the growth of Fannie Mae, the federal government now has a major impact on the industry. Since the government put Fannie Mae and Freddie Mac into receivership in 2008, this role has undoubtedly increased even further.

Since the early 2000s, mortgage market activity has consisted of three distinct functions: originating, investing in, and servicing mortgages. Sometimes, one institution performs all three activities. At other times, an institution may perform only one or two of the activities. For example, a mortgage broker may originate loans only, while a bank may originate, invest in, and service the mortgages. A savings and loan may originate the loan, sell it in the secondary market and, for a fee, continue to service the mortgage. This division of functions undoubtedly contributed to the lax lending standards of the 2005–2006 period. An originator who was going to sell the loan immediately would be less diligent in assessing creditworthiness than if the loan was to be held. However, we should note that when the mortgage crisis of 2008 is resolved that there will undoubtedly be more changes in this industry.

Recap

Mortgages are long-term debt instruments used to purchase residential, commercial, and farm properties. The underlying property serves as collateral and a lien is put on the property. In the event of default, the property may be repossessed and sold to recoup all or part of the losses from the loan. The principal is generally amortized over the life of the loan. The debt-to-income ratio and the loan-to-value ratio are the two most important criteria that determine whether or not a mortgage will be funded. The borrower's credit rating is also important. The principal and interest payments may be insured by the FHA or VA, which are agencies of the federal government. Conventional loans are not federally insured and are made by financial institutions and mortgage brokers. Lenders may also require borrowers without FHA or VA loans to obtain private mortgage insurance. Closing costs include loan origination fees, appraisals, property surveys, credit reports, title insurance, and processing fees. The borrower may also pay points, which are interest prepayments. The more points a borrower pays, the lower the interest rate.

Fixed Interest Rate Mortgage
Mortgage where the interest rate remains the same over the life of the loan.

Adjustable (Variable) Rate Mortgage (ARM)
Mortgages where interest rate is adjusted periodically to reflect changing market conditions.

Interest Rate Risk
The risk that nominal interest rates rise and the value of long-term assets fall.

FIXED AND VARIABLE INTEREST RATE MORTGAGES

With **fixed interest rate mortgages,** the interest rate remains constant over the life of the loan; with **variable interest rate mortgages,** the interest rate is adjusted periodically to reflect changing market conditions.

Fixed-rate mortgages have risks and benefits to both lenders and borrowers. For lenders, fixed-rate mortgages carry the **interest rate risk** that nominal interest rates will rise, causing the value of fixed-rate mortgages to decline. Remember the inverse relation-

ship between prices of long-term financial instruments and the interest rate. In addition, if long-term mortgages are funded with short-term deposits, the lending institution can experience a negative cash flow as the costs of liabilities rise above the earnings on assets.

If rates fall, the lender is initially better off with fixed interest rate mortgages. In this case, the lender sees the value of the fixed-rate mortgages increase and profit margins generally widen. However, an additional risk to the lender, called **prepayment risk,** is that when interest rates fall, the mortgage may be prepaid early by the borrower through refinancing and the lender will have to reinvest the funds at a lower rate. If interest rates fall and stay low for a significant period of time, lenders can expect a rash of prepayments as refinancing occurs. Prepayment penalties are fees that the borrower pays if the loan is paid off early. Conventional loans do not have prepayment penalties, but VA and FHA loans do have prepayment penalties that may discourage refinancing. Prepayment risk also includes the risk that the loan is prepaid early because the property is sold.

Prepayment Risk
The risk that a mortgage may be prepaid early and the lender will have to reinvest the funds at a lower interest rate.

Fixed-rate mortgages reduce the borrower's risk that loan payments will rise in the event that interest rates rise. The downside is that the borrower does not automatically benefit from falling rates. If rates fall, the borrower can refinance the loan, but there are generally substantial costs involved, such as closing costs and possibly prepayment penalties. With refinancing, the borrower gets a new loan to pay off the old loan. The new loan has a lower rate and correspondingly lower payment.

Variable interest rate mortgages, also known as **adjustable rate mortgages (ARMs),** charge an interest rate that changes with market conditions. They were first offered in the United States in 1970. The interest rate is tied to an index of short-term interest rates such as the Treasury bill rate, the LIBOR discussed in Chapter 10, the cost of funds for savings institutions, or the prime-lending rate. An index of short-term interest rates is used because lenders often fund mortgages with short-term deposits. In any case, the lender does not control the index. If the index rises, the interest rate and payments rise. The interest rate on the ARM is usually 2 to 3 percent above the index. The interest rate on ARMs is adjusted every month, every 6 months, or every 1, 2, or 3 years, depending on the terms specified in the loan. The maximum amount that the interest rate can rise is customarily 2 percentage points per year. There is often a cap, such as 5 to 6 percent, on the amount the rate can rise over the lifetime of the loan. If the initial rate is 6 percent and the lifetime cap is 5 percent, the maximum interest rate is 11 percent. Note that the interest rate can rise to 11 percent only if the index increases enough over time to justify an 11 percent rate.

Adjustable rate Mortgages (ARMs)
Mortgages that have a variable interest rate.

An advantage of ARMs to the lender is that the loan payments rise if the costs of funds rises, thus preventing the possibility of a negative spread. The disadvantage is that payments fall if rates fall. Just the opposite is true for the borrower—if rates rise, payments also rise; if rates fall, payments fall. ARMs reduce the interest rate risk to the lender. However, the default risk is increased. If rates and payments rise as interest rates rise, more mortgages will go into default because borrowers cannot afford the higher payments.

Other factors being constant, the initial interest rate for an ARM is always lower than that for a fixed-rate mortgage because of the reduced interest rate risk. Closing costs charged to initiate the loan are lower also. Because the ARM has lower payments than a fixed-rate loan, it is easier for a borrower to qualify and to qualify for a higher amount. Exhibit 14–3 summarizes the risks and benefits of fixed-rate and variable rate mortgages.

In the years leading up to the housing bust, lenders had offered increasingly innovative mortgages designed to meet the needs of consumers. Technological changes in information and computer technologies have facilitated the development of innovative mortgages. Many of the innovative types of mortgages such as subprime and Alt-A have disappeared in the crisis. Because of the competition among lenders, shopping for a mortgage can involve much time and consideration. The Internet is a good resource for

Innovative Types of Mortgages

Tilt Problem
The tilt problem refers to the fact that with inflation, conventional amortized home loans with fixed periodic nominal payments imply declining real payments over time. If earnings of homebuyers increase, this implies they face a larger real burden of home payments precisely when they are least able to afford them.

Despite the problems in the mortgage market in 2007, 2008, and 2009 due to reduced lending standards and subprime and Alt-A mortgages, there are still valid reasons for innovative types of mortgages designed to help young people afford homes. The reason has to do with what economists call the **tilt problem**—namely, the fact that because of inflation, the real value of traditional house payments falls over time. For example, with tradional fully amortized loans, there is a level house payment over the life of the loan, most commonly 30 years. Even with low inflation, the real value of mortgage payments will decline over time and hence the real burden of the mortgage is felt in the earliest years. A young person's income will usually increase more than inflation—namely, they will experience real increases in their wages due to experience—and hence the tilt problem is even more critical for them. Because of this, some innovations have occurred that attempt to equalize the real burden of the mortgage over the life of the loan.

Following are some of the major types of innovative mortgages, some of which are designed to alleviate the tilt problem:

Graduated payment mortgages offer initial low monthly payments with gradual escalation of the payments over the life of the loan. They are designed for borrowers who expect their incomes to rise. The downside is twofold. First, graduated payment mortgages may involve negative amortization when the initial payments do not cover the interest costs and the principal grows. The borrower ends up owing more than what was initially borrowed. Second, the borrower's income may not grow as expected, so he or she may not be able to afford the higher payments.

Graduated equity mortgages allow homeowners to pay off their loans in a shorter time period than what the initial payments justify. Payments start out as if the loan is amortized for 30 years. Payments grow over the life of the loan and the additional amount is applied to the principal. The result is that the loan is paid off in less than 30 years. The downside is that with graduated equity mortgages the payment goes up even if the borrower's income does not. Since most mortgage loans do not have prepayment penalties, borrowers who do not want to be locked into higher payments can achieve the same result by taking a 30-year loan and making higher payments when and if they are able to do so.

With the *biweekly mortgage,* the borrower pays one-half the monthly payment every 2 weeks. Since there are 52 weeks in a year, 26 biweekly payments are made. The result is that the equivalent of 13 monthly payments is made rather than 12. Thus, the borrower pays one extra monthly payment per year. For a 30-year loan, the biweekly payment pays off the loan in roughly 22 years. The term of the 15-year loan is reduced to 12 years.

Hybrid mortgages called *fixed-period ARMs* offer combinations of fixed- and variable-rate loans. For example, an interest rate may initially be fixed for 3, 5, 7, or 10 years but then becomes variable. The advantage is that the initial interest rate for the fixed period is lower than the comparable loan with a fixed rate for 30 years. The shorter the initial fixed term, the lower the interest rate relative to the 30-year fixed rate. Borrowers who anticipate having the loan or owning the property for less than

the fixed-rate period can save with this type of mortgage. These loans sometimes have prepayment penalties, so the buyer needs to fully understand the terms.

Reverse annuity mortgages are designed for retired individuals who want to stay in their homes but need part of the equity they have built up to supplement their income. With a reverse annuity mortgage, the lender sends the homeowner a monthly check and the mortgage balance increases by that amount. The lender puts a lien on the house for the higher amount. When the borrower passes away or sells the property, the lender is paid back through the sale of the property.

Second mortgages allow a property owner to borrow against the equity in their property. Second mortgages are made at higher interest rates than the original mortgage because the maker of the original mortgage has a first claim on the property in the event of a default. Thus, second mortgages are more risky and the lender must be compensated. Second mortgages are often used to improve the property.

14-3 The Risks of Investing in Mortgages

Default Risk—The risk that the borrower will not make the principal and interest payments as scheduled.

- The longer the term to maturity, the greater the default risk because the more distant future becomes more uncertain.
- The lower the down payment, the greater the default risk. The borrower has less to lose by defaulting.
- If interest rates rise, the default risk on variable-rate loans increases because monthly payments rise.

Interest Rate Risk—The risk that interest rates rise and the value of long-term mortgages decline. If long-term mortgages are funded with short-term deposits, the spread between the earnings on assets and costs of liabilities narrows and may become negative.

- The longer the term to maturity, the greater the interest rate risk.
- Variable-rate loans reduce the interest rate risk.

Prepayment Risk—The risk that mortgages will be prepaid early and that the funds will have to be reinvested at a lower return.

- Increases greatly when interest rates fall, particularly if they stay low for a significant period of time.
- Much less for variable-rate loans than for fixed-rate loans.

specific information about mortgages and interest rate and cost comparisons. Payment and amortization information, the size of mortgage you can qualify for given your income and debts, and a potpourri of various options regarding the terms of the mortgage loan are all at your fingertips. You can even apply online but you must be able to qualify! "A Closer Look" discusses some of the newer types of mortgages.

Recap Mortgages can have fixed or variable interest rates. With fixed-rate loans, the interest rate remains the same over the life of the mortgage. With variable-rate loans, the interest rate is adjusted periodically to reflect changing market conditions. Fixed-rate mortgages carry

the risk to the lender that nominal interest rates will rise and the value of the mortgage will fall. There is also a prepayment risk that when the interest rate falls, borrowers will prepay their loans and refinance at the lower rate, causing the lender to have to reinvest the funds at a lower rate. Variable-rate loans reduce the interest rate risk for the lender but increase the default risk. ARMs carry lower initial interest rates and have lower closing costs, but the borrower accepts the risk that his or her payment could rise substantially. Other types of mortgages include graduated payment mortgages, reverse annuity mortgages, graduated equity mortgages, biweekly mortgages, fixed period ARMs, and second mortgages. Now would be a good time to read the accompanying "A Closer Look" on the mortgage bailout plan.

SECONDARY MARKETS IN MORTGAGES

In this section, we discuss the burgeoning secondary markets in mortgages. We shall see that the federal government is involved in the secondary mortgage markets in two ways. First, an agency of the federal government insures the timely payment of principal and interest on standardized pools or packages of mortgages. Second, two government-sponsored enterprises sell securities and use the proceeds to purchase mortgages. As noted previously, these two agencies (Fannie Mae and Freddie Mac) were taken into conservatorship by the U.S. government in September 2008. Historically, when they purchase mortgages, new funds are provided to the mortgage market. How Fannie Mae and Freddie Mac will continue to function in the future is somewhat unclear although it is believed they will continue to support secondary markets, and indeed they continue to do so aggressively at the present time despite the conservatorship.

Secondary markets trade previously issued financial claims. Mortgages have two characteristics that made the development of secondary markets difficult. First, individual mortgages are for properties with different characteristics and diverse geographic locations. They are not as standardized as shares of stock or bonds issued by a large corporation. The outstanding shares of stocks and bonds of one corporation represent fairly identical claims on the corporation. Second, individual mortgages are typically for small denominations relative to other financial securities. For example, one million shares of identical stock with a value of $50 million can be issued by one corporation. Because of these characteristics, secondary markets for mortgages were slower to develop than secondary markets for stocks or bonds, wherein the outstanding financial claims are larger and more homogeneous.

Federal National Mortgage Association (Fannie Mae)
A privately owned, government-sponsored enterprise that sells securities and uses the proceeds to buy mortgages primarily of banks. Fannie Mae was put into conservatorship by the U.S. government in September 2008 because it was virtually insolvent due to the ongoing crisis in the mortgage market.

Prior to 1970, only mortgages insured by the FHA or VA were sold in secondary markets and directly to investors. The amount of market activity was very small. Fannie Mae (the **Federal National Mortgage Association**) was created by Congress in 1938 but did not establish a secondary market for FHA and VA loans until 1972. Fannie Mae issued bonds and bought FHA- and VA-insured mortgages. Still, the market did not grow to any significant extent and was even declining by the late 1960s because of a decrease in VA loans.

Ginnie Mae

Government National Mortgage Association (GNMA)
A government-owned program that guarantees the timely payment of interest and principal on bundles of at least $1 million of standardized mortgages.

In 1968, Congress created the **Government National Mortgage Association (GNMA, or Ginnie Mae, for short).** Ginnie Mae was split off from Fannie Mae to provide additional support for the mortgage market. In 1970, Ginnie Mae began a program in which it guaranteed the timely payment of interest and principal on *bundles* of $1 million or more of standardized mortgages. Small-denomination mortgages (mortgages up to

the FHA and VA limits) were standardized with regard to the debt-to-income ratios of borrowers and the loan-to-value ratios of properties. The standardized mortgages could be packaged together to be resold in secondary markets. Thus, Ginnie Mae guaranteed (for a fee) that the mortgages purchased with bond proceeds would be repaid and, hence, that the bonds would be repaid. The guarantee was backed up by the full faith and credit of the U.S. government. Ginnie Mae fostered the creation of large secondary markets that increased the liquidity of previously illiquid mortgages.

The secondary market in mortgages created by the Ginnie Mae guarantee operates as follows: private financial institutions such as banks or savings and loans gather or pool several Ginnie Mae federally guaranteed mortgages into a bundle of, say, $1 million. They then sell all or parts of the $1 million security, called a **mortgage-backed security,** to third-party investors such as pension funds, mutual funds, or individual investors. If investors need their funds back before the security matures, they can sell them in a secondary market for mortgage-backed securities. The secondary market for mortgage-backed securities operates similarly to the secondary market in corporate bonds. The minimum denomination for an individual purchase of a Ginnie Mae mortgage-backed security from a financial institution is $25,000. Borrowers then make their mortgage payments (on the GNMA-guaranteed mortgages) to the original lender. When the mortgage payments are received for all of the mortgages included in the $1-million bundle, the institution sends the owner(s) of the mortgage-backed security a check for the total of all payments. This constitutes the interest and principal payment on the security.

Mortgage-Backed Securities
Securities backed by a pool of mortgages; have a low default risk and provide a steady stream of income.

Ginnie Mae mortgage-backed securities have no default risk because of the government guarantee, provide a steady stream of income to the owner, and can be sold in secondary markets if funds are needed before the security matures. As a result, they have become highly popular with investors. Ginnie Mae is part of the Housing and Urban Development (HUD) Department of the U.S. government. As such, it is government owned.

Despite the lack of default risk, Ginnie Mae securities are subject to an interest rate risk. Since they are long-term instruments, the value of the securities will fall if the interest rate rises after the securities have been issued.

Unlike Fannie Mae, Ginnie Mae does not issue bonds. Other financial institutions such as banks, savings associations, or mortgage brokers issue bonds that are guaranteed (for a fee) by Ginnie Mae.

Federal Home Loan Mortgage Corporation (Freddie Mac)
A privately owned, government-sponsored enterprise that sells securities and uses the proceeds to buy mortgages primarily of thrifts. Freddie Mac was put into conservatorship by the government in September 2008 because it was virtually insolvent due to the ongoing crisis in the mortgage market.

Participation Certificate
A mortgage-backed security issued by Freddie Mac and backed by a pool of conventional mortgages.

Federal Housing Finance Agency (FHFA)
An independent federal agency that regulates Fannie Mae and Freddie Mac and was established by law on July 30, 2008, replacing the Federal Housing Finance Board and the Office of Federal Housing Enterprise Oversight. The FHFA had far greater regulatory powers than the previous regulators, including the ability to put the GSEs into conservatorship.

Fannie Mae and Freddie Mac

In 1970, Congress authorized Fannie Mae to purchase conventional (non-VA- or non-FHA-insured) mortgages. Congress also created the **Federal Home Loan Mortgage Corporation (Freddie Mac)** to lend further support to the VA, FHA, and conventional mortgage markets. Congress hoped to make housing more available by increasing the funds flowing into mortgages. The goal, which remains the same today, was to expand the opportunities for low- and moderate-income families to purchase homes. Although Fannie Mae purchased and held mortgages, it did not pool the mortgages to create a mortgage-backed security until 1981. Freddie Mac issued its first mortgage-backed security, called a **participation certificate,** in 1971. It resulted from a pool of conventional mortgages. Fannie Mae primarily buys the mortgages of banks while Freddie Mac primarily buys the mortgages of thrifts.

Fannie Mae and Freddie Mac are government-sponsored enterprises (GSEs). They were privately owned and managed corporations chartered by Congress, but are currently regulated by the **Federal Housing Finance Agency (FHFA),** which is an independent federal agency that was established by law on July 30, 2008. It replaced the

Federal Housing Finance Board and the Office of Federal Housing Enterprise Oversight, which were two previous regulators. The FHFA had far greater regulatory powers than the previous regulators, including the ability to put the GSEs into conservatorship. As noted earlier, the FHFA did put Fannie Mae and Freddie Mac into conservatorship in September 2008. Conservatorship is a legal status whereby a regulator can seize control of an institution that it regulates. Fannie Mae and Freddie Mac are still privately owned but the conservatorship, in this case, the FHFA, has all decision-making power. The question of when control will be returned to the stockholders, if ever, remains to be answered. The stocks of Fannie Mae and Freddie Mac had traded on the New York Stock Exchange and are still listed on the exchange; however, trading has been suspended due to the conservatorship. Fannie Mae and Freddie Mac are exempt from state and local corporate income taxes and, prior to the conservatorship, had a $2.25 billion line of credit with the U.S. Treasury. They provided loanable funds to the housing sector by purchasing conventional loans, packaging or pooling the mortgages together, and issuing mortgage-backed securities, using the pool of mortgages as collateral.

The mortgage-backed securities issued by Fannie Mae and Freddie Mac are called agency securities. The mortgages they purchase may also be held by them as investments instead of being packaged and sold as mortgage-backed securities.

Investors who purchase Fannie Mae and Freddie Mac mortgage-backed securities can then sell them in secondary markets if funds are needed before the securities mature. The secondary markets for mortgage-backed securities are created by market makers who buy and sell previously issued mortgage-backed securities. Some mortgage-backed securities are traded on organized exchanges.

Conforming Loan
A specific type of conventional loan that complies with criteria that allow it to be packaged together with other conforming loans and resold in the secondary market to Fannie Mae or Freddie Mac; as of 2009, conforming loans are for a maximum amount of $625,500.

Fannie Mae and Freddie Mac purchase a specific type of conventional loan called a **conforming loan.**[3] As of 2009, conforming loans are for $625,500 or less, depending on the geographical area, and comply with criteria that allow them to be packaged together and resold in the secondary market to Fannie Mae and Freddie Mac.[4]

The loan limit is adjusted each year in response to changes in housing prices. The securities that Fannie Mae and Freddie Mac issue are backed by the principal and interest payments on the mortgages that they have purchased. The principal and interest payment are not government guaranteed as with Ginnie Mae securities. When mortgages are sold to Fannie Mae or Freddie Mac, the lending institution receives additional funds to make new mortgages. This process is now an important source of funds to the mortgage market. In fact, this market has become so important that the bulk of mortgages are now made in accordance with the standardized lending guidelines that allow them to be sold to Fannie Mae or Freddie Mac. After being sold to Fannie Mae or Freddie Mac, the mortgages can be packaged and sold to investors as mortgage-backed securities.

Although the federal government has no legal obligation, many market participants assume that the government does "*de facto*" guarantee the timely payments of principal and interest on Fannie Mae and Freddie Mac securities. If the default risk is nil, the yield spread between these securities and U.S. government securities is due to differences in liquidity. The yield spread can be significant because secondary markets for Fannie Mae and Freddie Mac securities do not have the breadth and depth of Treasury securities. If market participants question the "de facto" government guarantee, as they did in mid-2000, the spread can also widen to include compensation for the perceived increased risk. However, as proven under the conservatorship, agency securities have been implicitly guaranteed despite the fact that regulators have put Fannie Mae and Freddie Mac into conservatorship.

"A Closer Look" discusses a recent controversy regarding the "implicit guarantee" for Fannie Mae and Freddie Mac securities. GSEs are also discussed at length in Chapter 20.

The Implicit Fannie Mae and Freddie Mac Guarantee

In the past decade, Fannie Mae and Freddie Mac have experienced astounding growth. In 1999, about 70 percent of the 6.1 million homes sold in the United States were purchased with loans that were bought by Fannie Mae or Freddie Mac. To do so, they issued $260 billion in long-term securities. The trend to purchase mortgages by issuing long-term mortgage-backed securities escalated. By the middle of 2001, Fannie Mae and Freddie Mac had about $2.6 trillion in outstanding securities that were backed by mortgages. In September 2008, that total was about $5.4 trillion, which was close to half of the total domestic mortgage market.

As noted earlier, despite being shareholder owned, Fannie Mae and Freddie Mac were chartered by the federal government, are exempt from state and local corporate taxes, and have a $2.25 billion line of credit with the U.S. Treasury. They were established to assist low- and moderate-income families in financing the purchase of homes that they might otherwise not have been able to buy. Many investors in Fannie Mae and Freddie Mac securities believed that these characteristics implied an implicit government guarantee for the securities issued by Fannie Mae and Freddie Mac where no explicit guarantee existed—namely, that the government would bail out the corporations if they got into a jam, even if the government was not legally obliged to do so.

The high growth combined with the implicit guarantee created concerns about the safety of Fannie Mae and Freddie Mac. In addition, Fannie Mae and Freddie Mac have loosened loan qualification requirements and were making less desirable, higher-risk, subprime loans. Such lending increases the possibilities that the companies could run into financial problems similar to those of the savings and loan industry in the 1980s. Needless to say, a bill before Congress in mid-2000 attempted to rein in Fannie Mae and Freddie Mac and to sever the ties between the corporations and the government. In addition, former Fed chairman Alan Greenspan and several Treasury officials expressed concerns about the growth of Fannie Mae and Freddie Mac. If property values should fall and there are massive defaults, would the government have to step in and bail them out?

This indeed did happen with the collapse in housing prices and record defaults on mortgages beginning in 2007. The result was that Fannie Mae and Freddie Mac sustained such large losses that they were virtually insolvent and were put into conservatorship by the U.S. government. A whopping $100 billion was immediately injected into them. A short time later, the government funds available for Fannie Mae and Freddie Mac was increased to $200 billion. It should be noted that despite the high probablilty that common stockholders in Fannie Mae and Freddie Mac will lose everything, those who believed there was an implicit guarantee on the securities issued by Fannie and Freddie were indeed proven to be correct. Even before the conservatorship and despite the magnitude of the crisis, the value of the agency securities was never seriously questioned!

PRIVATE MORTGAGE-BACKED SECURITIES AND COLLATERALIZED MORTGAGE OBLIGATIONS (CMOS)

In 1984, some private groups started to issue their own mortgage-backed securities. The new securities did not rely on the backing of Ginnie Mae and were not issued by corporations like Fannie Mae or Freddie Mac, which had ties to the federal government. Such issuers of private mortgage-backed securities include, among others, commercial banks, mortgage bankers, and investment banking firms. Like Ginnie Mae, Freddie Mac, and Fannie Mae mortgage-backed securities, privately issued mortgage-backed securities may also be sold in secondary markets. Securities issued by private issuers are rated by the major credit-rating agencies. The credit rating may also be improved by obtaining insurance that guarantees the timely payments of principal and interest on the securities. Again, the secondary markets are created by market makers who trade the previously issued securities. In the middle of 2001, the total amount of outstanding debt issued by private mortgage pools exceeded $814 billion, up from $11 billion in 1984 and $110 billion in 1991. By 2003, this amount was $1,023.4; it increased 42 percent to $1,455.5 in 2004, increased an additional 47 percent to $2,141.4 in 2005, and increased another 45 percent to peak at $3,013.3 in June 2007 before falling by 11 percent to $2,689 by the end of the third quarter of 2008. Note the dramatic increases in these numbers in the early 2000s. No doubt the housing bubble was encouraged by the inflow of funds from these markets. Thus, like Fannie Mae and Freddie Mac, privately issued mortgage-backed securities exploded in the early years of the 2000s. Like Fannie Mae and Freddie Mac, private issuers of mortgage-backed securities have experienced severe strains and often bankruptcy as a result of the financial crisis of 2008.

When mortgages are sold in the secondary market, the original lender, whether a bank or savings and loan, will sometimes continue to service the loan for a fee. Servicing a loan involves collecting the monthly payment, sending statements, and keeping records. In addition, servicing sometimes includes collecting property taxes and insurance payments, called *impounds*, and then disbursing these payments. In this way, the lender is guaranteed that the property taxes are paid and property insurance is maintained. Banks and other financial institutions are getting increasingly larger shares of their revenues from fees rather than interest. In addition to the secondary mortgage market, an active secondary market exists for trading the rights to collect the monthly payments (servicing the mortgage).

As noted previously, investors in mortgage-backed securities face the risk that the mortgages will be prepaid before they mature because the property is sold or refinanced, as well as the risk that the return will fall short of expectations. To reduce this risk, **collateralized mortgage obligations** have been developed by Freddie Mac. Collateralized mortgage obligations redirect the cash flows (principal and interest) of mortgage-backed securities to various classes of bondholders, thus creating financial instruments with varying prepayment risks and varying returns. Those who are most risk averse can choose an instrument wherein the principal will soon be repaid. Those who are willing to bear more risk can choose an instrument wherein the principal will not be repaid until later, and hence is subject to a greater prepayment risk. In exchange for more prepayment risk, the investor receives a higher return. Needless to say, such provisions make attractive choices available to a wider range of investors.

Collateralized Mortgage Obligations
Securities developed by Freddie Mac that redirect the cash flows (principal and interest) of mortgage-backed securities to various classes of investors, thus creating financial instruments with varying prepayment risks and varying returns.

Recap In recent decades, the government has become much more active in the mortgage market by guaranteeing the repayment of some mortgages and encouraging the development of a secondary market in mortgages. Most mortgages today are made in accordance with

lending guidelines that allow them to be packaged and sold as mortgage-backed securities. Fannie Mae and Freddie Mac are GSEs that issue mortgage-backed securities and use the proceeds to purchase mortgages. Fannie Mae and Freddie Mac securities have no explicit government guarantee. However, when they collapsed in September 2008 and were put into conservatorship by the U.S. government, the stockholders in Fannie Mae and Freddie Mac lost but the government made good on the securities the corporations had issued. Ginnie Mae guarantees the timely payment of principal and interest on mortgage-backed securities put together by private lenders. Ginnie Mae securities do have an explicit government guarantee. Other private groups issue mortgage-backed securities without government involvement. Secondary markets trade previously issued mortgage-backed securities and are similar to the secondary markets in bonds. Collateralized mortgage obligations redirect the cash flows (principal and interest) of mortgage-backed securities to various classes of bondholders, thus creating financial instruments with varying prepayment risks and varying returns.

THE DETERMINANTS OF THE PRICE OF MORTGAGES IN SECONDARY MARKETS

Up until the financial crisis of 2008, a large and active secondary market existed for mortgages and mortgage-backed securities. The collapse of this market brought on the financial crisis of 2008. Because so many bad mortgages were made that would never be repaid, lenders did not know which securities were good and which were bad. Hence borrowing and lending in the secondary markets froze up. We expect this market to return to normal once financial markets are stabilized and the economy works its way out of this financial crisis. In this section, we discuss determination of prices of previously issued mortgages and the related mortgage backed securities in secondary markets.

Like bonds, the price of a previously issued mortgage is simply the present value of the future stream of income from the ownership of the security. This consists of the monthly payment stream that includes both an interest and a principal payment, as depicted in Equation (14-1)

$$P_M = MP/(1 + d_M)^n \tag{14–1}$$

where

P_M = the price at which the security will trade in the secondary market
MP = the monthly payment, (including both principal and interest)
d_M = the monthly discount factor required by lenders in this market
n = the number of months remaining on the loan

Once the mortgage has been made, the original interest rate becomes irrelevant. Only the remaining monthly payments and the current discount factor are relevant in determining the mortgage's present value and, hence, the price at which the mortgage will trade.

Note that in Equation (14–1), because we are considering monthly payments instead of annual payments, d_M represents the monthly discount factor. To find the monthly discount factor, d_M, we merely divide the annualized discount factor, D_M, by 12. For example, a mortgage with 5 years remaining to maturity would have 60 more monthly payments—payments 1 through 60 spread over 5 years. If the annualized discount factor is 9 percent, the monthly discount factor is .75 percent (9/12 = .75). The payment[5] at the end of the first remaining year is the twelfth payment and the present value of this payment is $MP/(1 + .0075)^{12}$.

To find the price at which the mortgage will trade in financial markets, we need to compute the present value of each monthly payment remaining. The appropriate discount factor is the current interest rate on a security of equal risk, liquidity, servicing costs, and maturity. As noted before, servicing costs are the costs associated with collecting the monthly payments.

Because mortgages require the handling of monthly payments of principal, interest, and possibly impounds, mortgages have higher servicing costs than Treasury securities that make semiannual coupon payments. Lenders in the mortgage market must be compensated for these higher costs.

As summarized in Equation (14–2), the annualized discount factor used to determine the present value includes three components: a risk-free return, a risk premium, and a premium for the higher servicing costs that mortgages entail.

$$D_M = r_F + r_P + r_{SC} \tag{14–2}$$

The risk-free return is composed of the return on a Treasury security of comparable maturity.[6] When the risk-free interest rate changes, the discount factor and the prices of previously issued mortgages also change.

The risk premium includes the return the investor needs to be compensated for given the increased riskiness of owning mortgages. The risk premium includes compensation to the lender for the following possibilities:

- The borrower will default
- The loan will be prepaid early when reinvestment possibilities for the lender are less favorable than when the mortgage was originally made
- The lower liquidity of mortgages compared to Treasury securities will cause the lender to experience losses

When the mortgage is federally insured, as with Ginnie Mae securities, the risk premium will be lower than otherwise because the default risk is zero. In this case, the risk premium will include compensation for the prepayment risk and the lower liquidity of mortgages.

Treasury securities are considered to be risk-free for default, and the long-term government bond rate has been regarded as the risk-free interest rate. Many factors exist that affect the risk-free rate. One of the most important of these is the stance of monetary policy. If the Fed increases the supply of reserves, short-term interest rates fall and the supply of credit is expanded. Other factors held constant, long-term interest rates will fall but usually not as much as short-term rates. Changes in inflationary expectations and the level of economic activity also affect the long-term, risk-free interest rate. If inflation is expected to increase in the coming years, lenders will require and borrowers will be willing to pay an inflation premium to compensate for the loss in purchasing power. Likewise, if income is increasing, the demand for loanable funds increases and puts upward pressure on interest rates.

In the real world, the factors that affect the risk-free interest rate are interrelated. For example, expansionary monetary policy may cause market participants to expect higher inflation. Rather than leading to lower interest rates, interest rates may rise, despite the expansionary monetary policy. Likewise, a recession brought on by higher oil prices may lead to higher interest rates if the impact of the higher oil prices affects inflationary expectations more than the drop in income. Other factors such as international capital flows and the amount of government borrowing also have an impact on interest rates.

The borrower's ability to make the monthly payment affects the risk premium with which investors need to be compensated in order to purchase the mortgages. The risk premium for insured mortgages is much lower than that for uninsured mortgages.

14-4 Factors That Affect the Discount Factor

Factors that affect the risk-free rate:

- The stance of monetary policy
  1. Expansionary policy—rate falls
  2. Contractionary policy—rate rises
- Changes in inflationary expectations
  1. Higher prices expected—rate rises
  2. Lower prices expected—rate falls
- Changes in the economic outlook and the level of economic activity
  1. Economy improves—rate rises
  2. Economy deteriorates—rate falls
- Changes in government borrowing
  1. Government borrowing increase—rate rises
  2. Government borrowing decrease—rate falls

Factors that affect the risk premium:

- Changes in the economic outlook and the level of economic activity (pertains to uninsured mortgages only)
  1. Economy improves—rate falls
  2. Economy deteriorates—rate rises
- The prepayment risk that the mortgage will be prepaid early and that the lenders' reinvestment options are less desirable than when the original mortgage was made (pertains to insured and uninsured mortgages)
- Changes in the relative liquidity of mortgages and mortgage-backed securities relative to Treasury securities.

Any factors that affect the servicing costs of the loan such as changes in technology that reduce servicing costs:

Note that as the economic outlook and the level of economic activity improves, the risk-free rate rises while the risk premium falls, and vice versa. Hopefully, you can explain why.

A major factor affecting the risk premium for uninsured mortgages is the level of economic activity. In a booming economy, incomes and economic activity are increasing, thus reducing the number of defaults in the mortgage market. Likewise, interest rates rise and the prepayment risk declines. The reverse is true during economic downturns.

Innovative changes in technology reduce servicing costs. One such innovation is automatic payment deductions from a borrower's checking account. This saves the costs of sending out monthly statements and collecting and processing checks.

The factors that affect the discount factor are summarized in Exhibit 14–4.

Recap The price of a mortgage is the discounted value of the future stream of monthly payments over the remaining life of the loan. When the interest rate increases, the price of a previously issued mortgage decreases and vice versa. In secondary markets, the price that a mortgage-backed security trades at is based on the prices of the underlying mortgages in the pool that backs the security. The discount factor includes a risk-free rate, a risk premium, and a premium for the higher servicing costs that mortgages entail. Treasury securities are considered to pay a risk-free rate of return. The risk premium encompasses economy-wide risks, the risk that the mortgage may be prepaid early when investment opportunities for the lender are less favorable, and a premium for the lower liquidity of mortgages. The premium for the higher servicing costs of mortgages is affected by changes in technology

that reduce servicing costs. Secondary markets froze up as part of the financial crisis of 2008 but are expected to return to normalcy as the financial system recovers.

This completes our look at the mortgage market. You should be able to identify the ways in which this market is similar to and different from other financial markets such as the money market, the stock market, and the bond markets. Now would be a good time to read the accompanying "A Closer Look" on The Mortgage Bailout Plan. The next chapter begins our look at financial institutions, beginning with commercial banks.

A Closer Look

The Mortgage Bailout Plan

In February 2009, President Barack Obama announced a new mortgage bailout plan to help struggling homeowners. The goal of the program is to help at-risk homeowners (homeowners in danger of losing their homes) stay in their homes. The plan consists of two parts.

First, the government would commit to up to $200 billion to Fannie Mae and Freddie Mac to help lenders modify or refinance the loans of homeowners who have little or no equity. This part of the plan may help 4 to 5 million homeowners refinance to a lower interest rate and thus lower their payments. In early 2009, mortgage rates were close to historic lows because of the severe economic downturn. Under current standards, homeowners need 20 percent equity in their homes to refinance. Without the plan, homeowners with less than 20 percent equity in their homes would not be able to refinance. Many homeowners, who had put down 20 percent, now have much less equity, given the collapse in property values. For example, say a homeowner bought a house for $300,000 with a 20 percent down payment, an original loan amount of $240,000, and an interest rate of 6.25 percent. If the value of the home has fallen to $260,000, the homeowner would not be able to refinance to take advantage of the lower rates. With a market value of $260,000, he/she would only be able to borrow $208,000 despite owing almost $240,000. (Note that very little of the principal is paid off in the first few years of a mortgage.) The new plan allows such a homeowner to refinance at the current rates. At 6.25 percent, his/her original payment is $1,477.73 for principal and interest. If the homeowner can refinance at 4.75 percent, his/her payment would fall to $1,251.96, a savings of $225.77 a month. Ideally, homeowners whose payments fall under this plan will increase their spending on other items and help to get the economy going again. The funding for this program comes from the Housing and Economic Recovery Act passed in August 2008.

Second, under the Homeowner Stability Initiative, the plan provides up to $75 billion to help homeowners in danger of losing their homes to foreclosure through a loan modification. It is expected that 3 to 4 million homeowners will be able to take advantage of this plan. It could consist of writing down principal for borrowers who

are upside down (owe more than what their home is worth) or reducing interest payments so that at-risk homeowners will be able to keep their homes. Other options include extending the length of the loan to 40 years. All of the options result in lower house payments today and thus more homeowners who can now afford to stay in their homes. If foreclosures are reduced, this helps support property values in the area, thus benefiting all homeowners in the area.

The Treasury developed uniform guidelines for both programs and the guidelines (including a worksheet for homeowners at risk) are available online at www.financialstability.com.

Summary of Major Points

1. Mortgages are long-term debt instruments used to purchase residential, commercial, and farm properties. The underlying property serves as collateral that the debt will be repaid. In the event of default, the property may be repossessed and sold to recoup all or part of the losses. The principal is generally amortized over the life of the loan. The most common terms to maturity of mortgages are 15 and 30 years.
2. To procure mortgage loans, borrowers generally pay closing costs that include a loan origination fee, appraisal fees, surveys, processing fees, recording fees, points, and title insurance. A point is 1 percent of the loan and is a prepayment of interest that reduces the nominal interest rate on the mortgage loan. Borrowers may choose the number of points that they pay up front. The debt-to-income ratio and the loan-to-value ratio are the two most important criteria that determine whether or not a mortgage will be funded. The borrower's credit history is also important.
3. The timely payment of the principal and interest on a mortgage may also be insured for a fee by an agency of the federal government. The FHA and the VA insure mortgages that meet certain criteria. The purpose of FHA-insured loans is to help low-income families purchase homes. The purpose of VA loans is to help veterans purchase homes. Conventional mortgages are made by financial institutions and have no government insurance.
4. Mortgages have a default risk, an interest rate risk, and a prepayment risk. Default risk is the risk that the borrower will default on the loan. The interest rate risk is the risk that the interest rate will rise and the value of the long-term mortgage will fall. The prepayment risk is the risk that the borrower will repay the loan early and that the funds will have to be reinvested at a lower rate.
5. Mortgages may have a fixed or variable interest rate. With fixed-rate mortgages, the interest rate remains the same over the life of the loan. With variable interest rate mortgages, the interest rate fluctuates over the life of the loan with the general level of interest rates. The interest rate is tied to an index such as the one-year Treasury bill rate. There is usually an annual cap and a lifetime cap with regard to how much the interest rate can increase. Variable-rate loans reduce the interest rate risk for the lender but increase the default risk because if rates and payments rise, the borrower is more likely to default.
6. In recent decades, the government has become much more active in the mortgage market by guaranteeing the repayment of Ginnie Mae mortgages and sponsoring Fannie Mae and Freddie Mac. Fannie Mae and Freddie Mac are privately owned, government-sponsored enterprises that purchase a type of conventional loan called conforming loans. These markets have experienced severe strains and collapses that precipitated the financial crisis of 2008. Most mortgages today are made in accordance with lending guidelines that allow them to be packaged and sold as mortgage-backed securities. Fannie Mae and Freddie Mac mortgage-backed securities have no explicit government guarantee. The Ginnie Mae guarantee is explicitly

backed by the government. Private groups also issue mortgage-backed securities without an explicit or implicit government guarantee. Secondary markets exist that trade previously issued mortgage-backed securities.

7. The price of a mortgage is the discounted value of the future stream of monthly payments over the life of the instrument. When the interest rate increases, the prices of long-term mortgage securities decrease and vice versa. Prices of mortgage-backed securities are determined by the prices of the mortgages that make up the pool that backs the security. The discount factor used to determine the price of a mortgage or mortgage-backed security includes a risk-free rate, a risk premium, and a premium for the higher servicing costs that mortgages entail. Treasury bonds are considered to pay a risk-free rate of return. The risk premium encompasses economy-wide risks and includes the risk that the mortgage may be prepaid early when investment opportunities for the lender are less favorable. It also includes compensation for the lower liquidity of mortgages due to a less-developed secondary market.

Key Terms

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Review Questions

1. What is the difference between a fixed interest rate and a variable interest rate loan?
2. How is a mortgage similar to a bond? How is it different?
3. Is the monthly payment higher or lower if a loan is fully amortized versus if the loan calls for a balloon payment at the end of the term of the loan? Explain.
4. Henry and Sheree have low debt-to-income and low loan-to-value ratios for a loan on a new home. Their credit report has some delinquent items. Should their loan request be approved?
5. Explain the process by which a mortgage-backed security is created. What roles do Ginnie Mae, Fannie Mae, and Freddie Mac play? When Fannie Mae and Freddie Mac collapsed in 2008, did holders of their securities lose? What about shareholders?
6. If Sandi and Juan repay their mortgage early because they are refinancing or selling their home, why is there a risk for the lender?
7. How would a fall in real estate prices affect the value of previously issued mortgages? How would a fall in interest rates affect the value of previously issued mortgages?
8. Mohammad wants to make a $100,000 down payment to purchase a $200,000 house. Discuss the factors that could jeopardize his loan approval despite the large down payment.
9. Mari and Judy have just graduated from college and are purchasing a condominium. They expect that their incomes will be increasing in the next

few years. Should they consider a graduated payment or graduated equity mortgage? What are the pros and cons?

10. Alberto and Maureen have just bought their first condominium. They plan on staying in the condo for about five years and then buying a house. What type of mortgage loan would you advise them to get?
11. Technological advances have reduced the servicing costs on loans. What would happen to the discount factor applied to value mortgages and mortgage-backed securities? Why?
12. Discuss what would happen to the discount factor for mortgages under the following circumstances:
    a. A recession is expected in the near future
    b. The Fed has taken action to raise interest rates
    c. International financial crises have caused an inflow of funds into the United States
    d. The federal government is running a larger surplus than expected
13. How can investing in a collateralized mortgage obligation entail less risk than investing in a mortgage-backed security? Can it ever entail more risk?
14. What are the characteristics of financial assets that have highly developed secondary markets?
15. What is the difference between the secondary market in mortgages and the secondary market in mortgage-backed securities?

Analytical Questions

16. Assume that the risk-free rate is 5 percent and the risk premium for investing in mortgages is 2 percent. Also assume that it costs approximately 1 percent to service a mortgage loan. What will the discount factor for mortgages be?
17. Will the following events increase, decrease, or leave the mortgage rate unchanged?
    a. The Fed lowers the interest rate because of a slowdown in economic activity.
    b. Technological changes reduce the costs of servicing mortgage loans.
    c. The default rate on mortgages increases because of falling property values.
18. Go to the Freddie Mac Internet site at www.freddiemac.com.
    a. Click on the "economic outlook" link.
        1) Summarize the economic outlook.
        2) How is the housing market faring?
        3) What about interest rates and Fed policy?
    b. Scroll down the left "What's New" column.
        1) Summarize any information about new or previously issued Freddie Mac securities.
19. Go to www.mtgprofessor.com.
    1) What is the monthly mortgage payment on a $200,000 mortgage amortized over 30 years? Over 15 years?
    2) Assuming the borrower has no other debts, what is the income needed to qualify for a 30-year 8 percent mortgage on a $200,000 house with 20 percent down? And for a 15-year 8 percent mortgage?
    3) Next, assume the borrower has additional car, credit card, and student loan debt payments of $700 per month. What is the income needed to qualify for 30 year loan? For a 15 year loan?

Suggested Readings

The Web site **www.ginniemae.gov** provides information on the operations of the GNMA (Ginnie Mae); **www.fanniemae.com** and **www.freddiemac.com** provide information about Fannie Mae and Freddie Mac.

The Web sites **www.mortgagequotes.lycos.com** and **www.mtgprofessor.com** discuss mortgage rates, the size of mortgage you can afford, and provide a payment calculator.

Robert B. Avery, Kenneth P. Brevoort, and Glenn B. Canner look at recent turmoil and lending in the mortgage market in an article titled "The 2007 HMDA Data," *Federal Reserve Bulletin* (December 23, 2008), pp. A107–146.

A speech by Fed chairman Ben S. Bernanke, "Housing, Mortgage Markets, and Foreclosures" (December 4, 2008) is available online at **www.federalreserve.gov/newsevents/speech/bernanke20081204a.htm.**

An article that foresees the eventual conservatorship of Fannie Mae and Freddie Mac is Stephen Labaton and Steven R. Weisman, "U.S. Weighs Takeover of Two Mortgage Giants," *New York Times*, July 11, 2008.

An article by David Ellis, "U.S. Seizes Fannie and Freddie" discusses the actual takeover. It is available online at **http://money.cnn.com/2008/09/07/news/companies/fannie_freddie/.**

Two early comprehensive articles on the controversies regarding the government's ties to Fannie Mae and Freddie Mac are Patrick Barta, "Why Calls Are Escalating to Clip Fannie Mae's, Freddie Mac's Wings," *Wall Street Journal*, July 14, 2000, and Richard W. Stevenson, "Defending Home Turf from Attack; Fannie Mae Is Facing Assault by House Panel and Business Rivals," *New York Times*, April 22, 2000.

For an analysis of mortgage refinancing, see Peter Brady, Glenn B. Canner, and Dean M. Maki, "The Effects of Recent Mortgage Refinancing," *Federal Reserve Bulletin* (July 2000), pp. 441–450.

Mortgage-backed securities are the subject of "Remarks by Chairman Alan Greenspan," a speech given by the former Fed chairman before a conference on mortgage markets and economic activity sponsored by America's Community Bankers, Washington D.C., November 2, 1999. The text is available on the Fed's Web site at **www.federalreserve.gov.**

Other articles on mortgages include Paul S. Calem and Stanley D. Longhofer, "Anatomy of a Fair-Lending Exam: The Uses and Limitations of Statistics," *Finance and Economics Discussion Series* no. 2000–15, Board of Governors of the Federal Reserve System, 2000; Joe Mattey, "B2B E-Commerce in Residential Mortgages," *FRBSF Economic Letter* no. 2000–23, Federal Reserve Bank of San Francisco, July 28, 2000; Stanley D. Longhofer and Paul S. Calem, "Mortgage Brokers and Fair Lending," *Economic Commentary*, Federal Reserve Bank of Cleveland, May 15, 1999; and Joe Mattey, "Mortgage Interest Rates, Valuation, and Prepayment Risk," *FRBSF Economic Letter* no. 98–30, Federal Reserve Bank of San Francisco, October 9, 1998.

Also of interest is Robert Winnett and Kathryn Cooper, "House Boom Sets Scene for 100-Year Mortgage," *London Sunday Times*, September 3, 2000; Kristin Downey, "Study Refutes Myth That Americans Are Best-Housed People," *Minneapolis Star Tribune*, March 9, 1991.

Endnotes

1. Even though outstanding mortgages are the largest debt instrument, in recent years, despite the drop in stock prices from mid-2007 through 2008, the value of equities (stocks) has exceeded the value of mortgages by a substantial amount. The reason is that as new mortgages are issued, old mortgages continue to mature, whereas equities have no maturity date. For example, at the end of March 2008 the outstanding value of domestic equities was over $19.6 trillion while the outstanding value of mortgages was over $14.7 trillion.
2. The alternative to an amortized loan would be to make interest-only payments and to repay the principal in a balloon payment at the end of the loan; this was common prior to the Great Depression.
3. Nonconforming loans, in contrast, are called jumbo loans and are temporarily for amounts greater than $625,500 in early 2009. Ceteris paribus, jumbo loans have higher interest rates than do conforming loans. Fannie Mae and Freddie Mac do not buy nonconforming loans.
4. Although they mainly purchase conventional loans, Fannie Mae and Freddie Mac have also purchased FHA- and VA-insured loans.
5. If annual payments were made instead of monthly payments, there would be five annual payments remaining. The present value (at the start of the first year) of the first year's payment alone, (made at the end of the first year) would be $\textit{Annual Payment}/(1+.09)^1$.
6. The comparable maturity for a Treasury security and a mortgage are not the same as the terms to maturity. For example, since a 30-year mortgage payment includes both a principal and interest payment each month, the comparable term of the mortgage will actually be less than a 30-year Treasury that does not repay any of the principal until the end of 30 years.

PART 5

Financial Institutions

15 Commercial Banking Structure, Regulation, and Performance

16 Savings Associations and Credit Unions

17 Regulation of the Banking System and the Financial Services Industry

18 Insurance Companies

19 Pension Plans and Finance Companies

20 Securities Firms, Mutual Funds, and Financial Conglomerates

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CHAPTER FIFTEEN 15

A holding company is the people you give your money to while you're being searched.

—Will Rogers

Commercial Banking Structure, Regulation, and Performance

Learning Objectives

After reading this chapter, you should know:

Who regulates whom in the banking system and why

What a bank holding company is and why virtually all large banks are now organized as holding companies

What a financial holding company is

The reasons for the wave of bank mergers following the regulatory changes of the 1990s

The nature of the evolutionary changes of the banking system in recent years

THE BIGGEST INTERMEDIARY IN TOWN

The chief executive officer (CEO) convenes the regular Monday morning meeting of the managers of the bank's key divisions. As the division heads report, the managers learn that several large corporate customers are requesting short-term loans and that deposit growth has slowed in recent weeks. In response to this and other information, the CEO instructs the manager of the bank's liabilities to borrow more funds in the certificate of deposit (CD) market, and she directs the senior loan officer to pursue the corporate loan business aggressively by offering attractive terms on the requested loans. Since the slowdown in deposit growth appears to be related to increased competition from other financial intermediaries (FIs) in the area, particularly one large savings and loan (S&L), the managers endorse a major marketing plan designed to inform the public about several new services now available to depositors. The CEO also brings the committee members up-to-date on bank mergers among some key competitors. In addition, she discusses several possible mergers upper management is considering. Although mergers are supposed to exploit economies of scale and make the bank more profitable, committee members silently worry that they may translate to a loss of jobs. Finally, "the chief" directs the members of the committee to be "on their toes." Bank regulators have arrived to conduct their periodic examination of the bank's books and operations.

This story depicts the start of a fairly normal week at a bank. We hope it conveys the flavor of the dynamic world of banking and helps to introduce the issues to be examined in this chapter. What risks must banks manage? What competition do banks face in the markets for loans and deposits? What new services are banks offering? Why have there been so many bank mergers in recent years? What is a financial holding company? Who are the regulators, and what are the auditors looking for?

As discussed in Chapter 4, banks are one of the largest types of FIs and play an important role in transferring funds from lenders in our economy to borrowers. Banks borrow or hire funds from lenders and pay interest on the borrowed funds. They lend funds to borrowers and earn interest on the loaned funds. Ignoring some of the details for the moment, the excess of the interest earned on the loaned funds over the interest paid on the borrowed funds is the profit earned from financial intermediation.

As they "intermediate," commercial banks make a number of decisions. These decisions include (1) the interest rates they will pay to "borrow" or "hire" funds from depositors, (2) the types of deposits they will offer the public, (3) the interest rates they will charge to lend funds to borrowers, (4) the types of loans they will make, and (5) the types of securities they will acquire. Each of these decisions affects the borrowers' demand for funds (borrowing) from banks and/or the lenders' supply of funds (lending) to banks. Ultimately, we need to know much about the macroeconomic and microeconomic aspects of banking. On the macro side, how does bank behavior affect interest rates, the money stock, the volume of credit extended by banks, and economic activity? On the micro side, how do banks make the pricing and quantity decisions just mentioned, how do regulations affect such behavior, and how has bank behavior changed over time? We begin by examining the banking regulations that have led to our current commercial banking system. We then look at how the system's structure has been changing in recent years. Finally, we discuss bank efforts to increase profits and look at how banks have performed in this area over the last decade, particularly given the ongoing financial crisis of 2008 and 2009. Other issues are covered in succeeding chapters.

Again, we emphasize that banks, like many other firms and industries in our society, are continually changing and attempting to innovate. As a result, many institutional details will change somewhat as time passes. Nevertheless, we can look at how the bank-

ing system has evolved, provide a picture of the current system, and offer a glimpse at where the industry may be going.

THE BANKING REGULATORY STRUCTURE

As we saw in Chapters 1 and 9, the primary reason the banking system is regulated is to preserve its safety and soundness and ensure the fair and efficient delivery of banking services to the public. From the regulator's perspective, continuous oversight is needed to ensure that banks are operated prudently and in accordance with standing statutes and regulations. Broadly speaking, regulation involves the formulation and issuance of specific rules to govern the structure and conduct of banks.

For the most part, the regulatory structure prevailing at the beginning of the 1970s was inherited from and is the product of the 1930s. This structure was put in place as a result of events that precipitated the Great Depression. In October 1929, prices on the New York Stock Exchange collapsed. The Dow Jones Industrial Index, a measure of stock market values, stood at 200 in January 1928, rose to 381 in September 1929, and then collapsed. Eventually, the Dow reached a low of 41 in July 1932. From 1929 through 1933, more than 8,000 banks failed, industrial production fell more than 50 percent, and the nation's unemployment rate rose from 3 percent to 25 percent. At the time, people believed that these events were intimately connected and that the Great Depression was caused and/or severely aggravated by serious defects in the structure and regulation of the financial system. More specifically, the failure of many financial institutions was alleged to be the result of (1) "excessive and destructive competition" among banks, which had led to the payment of unduly high interest rates on deposits, and (2) the granting of overly risky loans, particularly those extended to stock market speculators. Further, it was believed that banks sought out such loans and the high yields they carried because of the high rates being paid on deposits. When the stock market crashed, the value of the speculators' portfolios collapsed, leading them to default on their bank loans. The banks, in turn, became insolvent (bankrupt) or were left so weakened that depositors rushed to withdraw their funds.

Glass-Steagall Act of 1933
Banking legislation that established Regulation Q interest rate ceilings, separated commercial and investment banking, and created the FDIC. It was enacted in response to the financial crisis that led to the Great Depression.

Regulation Q
Interest rate ceilings on deposits at commercial banks that were established during the Great Depression and phased out after 1980.

Federal Deposit Insurance Corporation (FDIC)
The federal agency that insures the deposits of banks and savings associations.

Bank Runs
When many depositors simultaneously attempt to withdraw their funds from a bank.

Given this diagnosis, the legislative and regulatory remedies established at the time are readily understandable.[1] Among the most widespread and ultimately pernicious "cures" was the establishment of maximum ceilings on the interest rates banks could pay on deposits. The ceilings, which were imposed under the **Glass-Steagall Act of 1933,** were popularly known as **Regulation Q.** Interest payments on demand deposits, which were the only type of checkable deposit in existence at the time, were prohibited, and interest payments on time and savings deposits were not to exceed the rate ceilings set by the relevant regulatory authority. The rationale for the ceilings was seductive and attractive: By holding down the rates on deposits (sources of bank funds), the rates on loans (uses of funds) could be held down. Banks would no longer need to seek out and grant high-risk, high-yield loans.

To further limit bank failures, the Glass-Steagall Act put deposit insurance into place with the creation of the **Federal Deposit Insurance Corporation (FDIC).** As noted in Chapter 4, the deposits of most banks and other depository institutions were fully insured up to $100,000 between 1980 and 2008. In 2006, deposit insurance on retirement accounts was increased to $250,000. Due to the financial crisis in 2008 and to instill confidence into the system, deposit insurance was temporarily increased to $250,000 per account from September 2008 through the end of 2009. Beginning in 2010, deposit insurance limits will be adjusted for inflation every five years. The presence of deposit insurance eliminated **bank runs** or bank panics, in which depositors, fearing that their bank would fail, "ran" to get their funds out.

In addition, the Glass-Steagall Act separated commercial banking from investment banking. Investment banking is the underwriting and marketing of primary corporate securities. Banks were no longer allowed to own or underwrite corporate securities. Thus, the assets commercial banks could hold were effectively limited to cash assets, government securities, and loans. The commercial bank's role was to accept deposits paying up to the Regulation Q interest rate ceilings and to make predominantly commercial loans.

We have already seen that the Fed is the most important regulator of its commercial bank members. The Fed also sets reserve requirements and provides discount loan facilities for all depository institutions. Under the regulatory structure that prevailed from the 1930s until the early 1980s, the Fed shared regulatory responsibilities with two federal bodies—the **Comptroller of the Currency** and the FDIC—and with state banking departments. Prior to the 1980s, the scope of regulation included restrictions on entry, branching, types of assets and liabilities permitted, financial services that could be offered, and interest rates that could be paid on certain types of deposits and charged on certain types of loans. Today, banks have found ways around many of these regulations; many others have been relaxed if not totally eliminated. Recently, other regulations dealing mainly with bank capital requirements and risk management have become increasingly important. In Chapter 17, we look at major legislation in recent years that has drastically altered the structure of the banking system.

Comptroller of the Currency
The federal agency that charters national banks.

To aid in understanding this complex regulatory structure, it is useful to begin with the birth of a bank. Unfortunately (or should we say fortunately), none of us can just decide to open a bank tomorrow. Commercial banks in the United States are **chartered;** that is, they are given permission to engage in the business of commercial banking by either the federal government or one of the 50 state governments. When applying for a charter, the applicant must demonstrate a knowledge of the business of banking and have a substantial supply of capital funds.[2] If a bank's charter is granted by the federal government, the bank is called a **national bank.** The office of the Comptroller of the Currency is the federal government agency charged with chartering national banks. For example, Wells Fargo Bank of San Francisco is a federally chartered bank. A bank can also be chartered by a state banking authority. This system, in which commercial banks are chartered and regulated by the federal government or a state government, is usually referred to as the **dual banking system.** Think of it as a dual chartering system.

Chartered
Given permission to engage in the business of commercial banking. Banks must obtain a charter before opening.

National Bank
A bank that has received a charter from the Comptroller of the Currency.

Dual Banking System
The system whereby a bank may have either a national or a state charter.

Banks that are federally chartered must belong to the Federal Reserve System and must subscribe to federal deposit insurance with the FDIC. The latter provides insurance for individual deposit accounts currently up to $250,000 per account and charges banks an insurance premium that varies with the reserves that the insurance fund has available. The premium is slightly more for high-risk banks. Thus, national banks are subject to the regulatory and supervisory authority of the Comptroller, the Fed, and the FDIC.

A state-chartered bank will be regulated by its state banking authority. If it chooses to join the Federal Reserve System, the state bank will also have to subscribe to federal deposit insurance, since all Fed members must have FDIC insurance. Thus, in this case, the state-chartered bank will be subject to regulation by the Fed and the FDIC. Finally, state banks may also subscribe to FDIC insurance without joining the Fed.[3]

One of the interesting and probably unique features of the system is that those being regulated can choose the regulator. In effect, they can "vote with their feet." By this we mean that banks can apply for either a state or a federal charter or attempt to shift from one to the other.

The decisions banks have made on chartering, branching, and membership in the Fed are captured in Exhibit 15-1. Presumably, these decisions are based on expected prof-

Looking Back

The Origins of the Dual Banking System

How did we end up with a dual banking system? Actually, it was not the intent of Congress. The National Currency Act of 1863 and the National Banking Act of 1864 established the Comptroller of the Currency, which chartered national banks for the first time. The banknotes issued by the national banks circulated at full value and were backed by government bonds.

Prior to this time, all banks were chartered by the states. The state banks issued their own banknotes, which, under normal circumstances, were redeemable at face value in the bank's geographic trade area. Outside the bank's geographic area, the notes were often redeemable at less than face value. The acts also imposed a 10 percent tax on banknotes issued by state banks. The purpose of the restrictive tax was to make state banknotes so undesirable that state banks would be driven out of business. If they were unable to issue notes, then they could not make loans. A financial innovation—the acceptance of demand deposits—saved the state banks from extinction by allowing them to stay in business without issuing their own banknotes. The innovation foiled the plans of Congress to drive state banks out of business.

Incidentally, if you have any old state banknotes or national banknotes lying around your house, you may want to check out how much they're worth. At a mid-1990s show in St. Louis, Missouri, a $10 banknote from Platteville National Bank sold for $9,500.[a]

Endnote

a. "The Currency Dealer," *Greensheet Newsletter* (Torrance, CA: December 1995).

itability. The data in Exhibit 15-1 indicate that as of September 30, 2008, about 77 percent of all banks had state charters, while about 22 percent had national charters. The 1,556 national banks had 1,260,417 full-time equivalent employees, while the 5,590 state banks had only 692,008. Although state-charted banks are more numerous, those that are nationally chartered tend to be larger. Most state-chartered banks do not belong to the Federal Reserve System, although larger state banks do tend to be Fed members.

Historically, most banks, especially smaller ones, found it more profitable to be state-chartered non-Fed members. State banking authorities were often viewed as being more friendly in regulating and supervising institutions and more lenient in allowing nonbanking activities than their federal counterparts. In addition, the reserve requirements, which specify that a bank must hold reserve assets equal to a portion of its deposit liabilities, were often lower for state-chartered/regulated banks than for national banks regulated by the Fed. Lower reserve requirements meant higher potential profits. Because a smaller amount of reserve assets were held, a larger proportion of deposit inflows could be used for loans and other interest-earning investments. (The required reserve ratio is now set by the Fed for all depository institutions and is the same for all depository institutions.) Larger banks, which usually were Fed members, often provided nonmembers with many of the services the Fed would normally have provided. Fed

15-1
FDIC-Insured Banks, September 30, 2008

	Number of Banks	Deposits (in Billions of Dollars)	Assets (in Billions of Dollars)
Total domestic banks	7,146	$7,778.51	12,050
National charter	1,556	5,134.85	8,334.90
State charter	5,590	2,643.66	3,715.52

Source: Federal Deposit Insurance Corporation.

members also have to buy stock in the Fed equal to 3 percent of their assets. The stock pays dividends that are lower than what banks could earn by making loans.

Nearly all banks have elected to be part of the FDIC. Apparently, banks feel it is important to offer depositors the safety and peace of mind federal deposit insurance engenders. For those who think this point is trivial, recall that in the midst of the Great Depression—between 1929 and 1933 to be exact—more than 8,000 banks failed in the United States. As those banks failed, depositors in other banks rushed to withdraw their funds out of fear that the problems would spread. Such a bank run on even a healthy, **solvent** bank can cause severe difficulties, because the bank's asset portfolio may be illiquid, with not enough cash or liquid assets on hand to pay off the many depositors making withdrawals. Limiting cash withdrawals (to, say, $25 a week) or closing the bank temporarily, as often occurred, reinforced the public's perception that this bank and perhaps all banks were in serious difficulty. As the epidemic spread, such illiquid banks were often forced out of business, and the entire financial system was threatened.

Solvent
When a bank or other firm has assets worth more than liabilities (opposite of "bankrupt" or "insolvent").

In what must be judged one of the most successful pieces of legislation in history, Congress created the FDIC in 1933. This, by and large, halted the runs on solvent but illiquid banks and thus restored some stability to the banking and financial systems.[4] Deposit insurance was first made a "full faith and credit obligation" of the federal government in 1989. Prior to that year, the FDIC was on somewhat the same footing as private insurance companies in that the federal government was not required by law to pay off depositors if the FDIC ran out of funds in the face of widespread bank failures.

Clearly, having a dual banking system with a variety of regulatory authorities leads to a considerable overlap of responsibilities, with some institutions subject to regulation and supervision by as many as three regulatory authorities. In an attempt to minimize the overlap, primary regulatory responsibility for each category of banks has been assigned to one regulator, who then shares the resulting information. Regulatory responsibility has been distributed in the following manner: (1) the FDIC for state-chartered, insured banks that have not joined the Fed; (2) the Comptroller of the Currency for national banks, which also must be FDIC insured and Fed members; (3) the Fed for state-chartered, insured members of the Fed, and all bank and financial holding companies (more on them later); and (4) the states for state-chartered banks that do not subscribe to FDIC insurance or belong to the Fed. Exhibit 15-2 gives additional details for each category. The **Federal Financial Institutions Examinations Council (FFIEC),** which was created by Congress in 1979, prescribes uniform principles, standards, and report forms for the federal examination of financial institutions by the Fed, the FDIC, and the Office of the Comptroller of the Currency. The FFIEC also makes recommendations to promote uniformity in the supervision of financial institutions.[5]

Federal Financial Institutions Examinations Council (FFIEC)
A federal agency that prescribes uniform principles, standards, and report forms for the federal examination of financial institutions by the Fed, the FDIC, and the Office of the Comptroller of the Currency and that makes recommendations to promote uniformity in the supervision of financial institutions.

Some people believe that the current set of regulations, supervisory authorities, and statutes of the dual chartering system provides an incentive for local banks with state charters to adapt and structure their services so as to fulfill the needs of the local

15-2
Regulatory Responsibilities

• **FDIC:**	Regulates state-chartered, insured non-Fed members and insured branches of foreign banks
• **Comptroller of the Currency:**	Regulates national banks that are not bank holding companies and federally chartered branches of foreign banks
• **Fed:**	Regulates state-chartered, insured members of the Fed, all bank holding companies, all financial holding companies, and branches of foreign banking organizations operating in the United States and their parent banks
• **States:**	Regulate state-chartered, non-FDIC-insured banks that are not Fed members

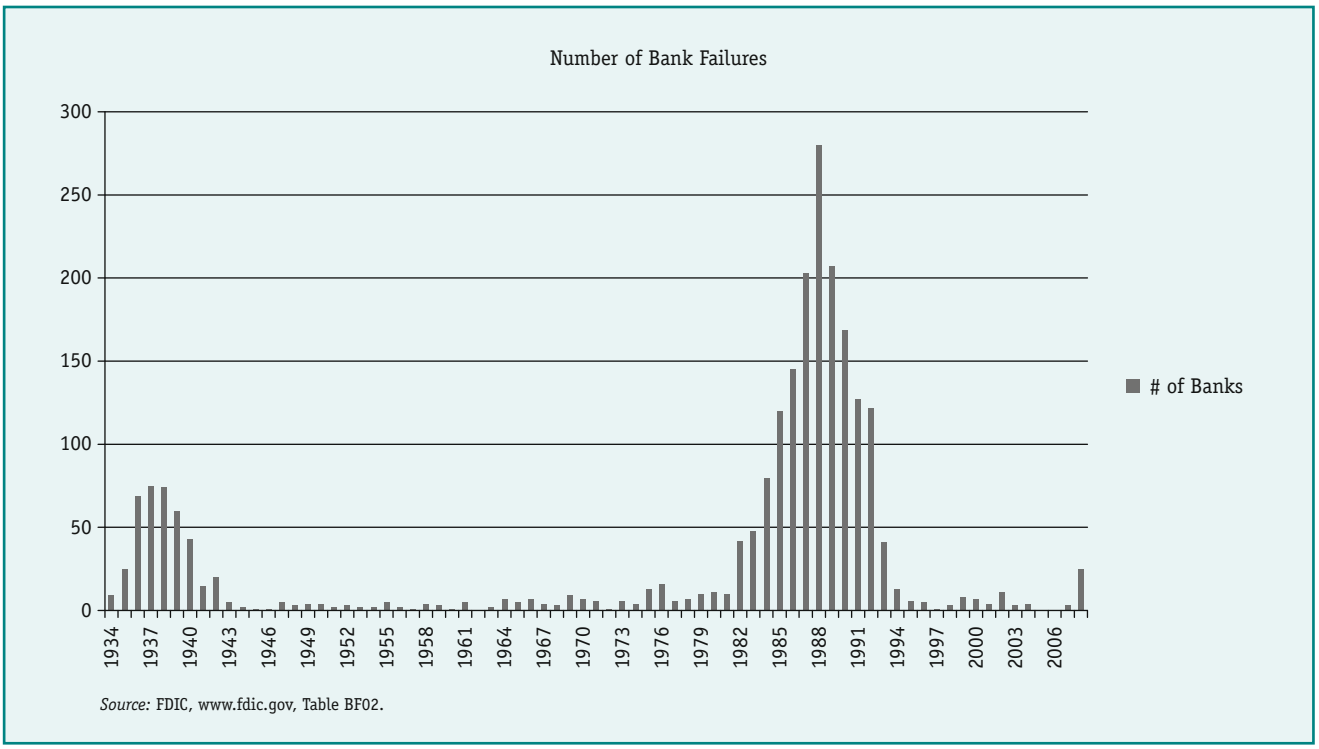
Sources: Federal Deposit Insurance Corporation.

community, while guidelines for federally chartered banks may relate to national and international concerns. They also argue that the dual system fosters competition and innovation among banks. Opponents of the dual system argue that the overlapping of regulatory agencies breeds considerable confusion and leads to lax enforcement; they maintain that this system gives banks considerable freedom to escape proper supervision and regulation. By the early 2000s, many of these discussions became irrelevant and obsolete because of ongoing changes in regulations, technological advances in the ways funds are transferred, and other financial innovations.

As Exhibit 15-3 shows, bank failures in the mid- and late 1980s were at the highest level since the inception of the FDIC in 1933. Between 1955 and 1981, bank failures averaged 5.3 per year. Between 1987 and 1990, they averaged a whooping 189 per year! Although still high in the early 1990s, in the period up to 2007, bank failures had fallen dramatically, with no banks failing from July 2004 until January 2007. In 2007, three banks failed—each merged with a healthy one. In 2008 the developing financial crisis was noticeably impacting commercial banks and there were 25 bank failures. Most dramatically, on Thursday evening, September 25th the FDIC took over Washington Mutual, separated it from its holding company, and sold nearly all of it to J.P. Morgan Chase for $1.9 billion. Washington Mutual had $307 billion in assets, making this by far the largest failure of a depository institution ever. Less than a week later, it appeared another huge depository institution, Wachovia, was about to be purchased by Citigroup. Wells Fargo made a superior offer on October 3, 2008. Less than three months earlier in July, Indy Mac Bank of Pasadena, California, with over $32 billion in assets, had been declared bankrupt and the FDIC was named as Conservator. A number of depositors with accounts in excess of the $100,000 insurance limit suffered losses. This seemed to fuel the ongoing crisis and financial instability. No such depositor losses were realized as a result of the resolution of problems at Washington Mutual and Wachovia.

When large bank failures escalated in 2008, many industry observers were extremely nervous. To what extent was this increase in bank failures the result of the ongoing financial crisis versus lax regulation? Some in Congress have viewed bank failures as a result of ineffective regulation. One could, however, argue the opposite—that bank failures reflect regulators doing their job and closing insolvent banks before they become even bigger problems.[6] In Chapter 17, we look at ways regulators have implemented new and existing regulations to ensure adequate banking supervision. We also

15-3
Number of Bank Failures by Year, 1934–2007



Source: FDIC, www.fdic.gov, Table BF02.

look at suggestions for overhauling the federal regulatory structure of banking and other financial services, in response to the ongoing changes that are occurring within the industry.

Recap Federally chartered banks are called *national banks* and must belong to the Fed and subscribe to FDIC deposit insurance. State-chartered banks can, if they choose, belong to the Fed and/or subscribe to FDIC insurance. Nearly all banks subscribe to FDIC insurance. This dual banking system has allowed banks to choose their regulators. Seventy-seven percent of banks have state charters, while 23 percent have national charters. National banks tend to be much larger and have many more employees than state banks. Although the rate of bank failures was quite low from the 1990s until 2007, in 2008 several large depository institutions failed, including Countrywide Financial, Indy Mac Bank, Washington Mutual, and Wachovia Bank.

THE STRUCTURE OF THE COMMERCIAL BANKING SYSTEM

In establishing the statutes and regulations that have contributed to the evolution of the structure of the commercial banking system, Congress and the regulatory agencies were guided by several considerations. It was assumed that a large number of small banks would encourage competition and efficiency, which would result in conduct or behavior by firms that was beneficial to the public and society at large. At the same time, the more competitive the market, the greater the risk of failure of an individual firm from the

pressure of intense competition. Although the public would be provided with the largest quantity of financial services at the lowest prices, more banks could fail in a highly competitive environment.

In contrast, a structure characterized by a few large firms would result in limited competition, inefficiencies, and fewer benefits for the public in the form of lower prices and improved quality and quantity of financial services.[7] At the same time, fewer banks would fail in a noncompetitive market. (Because of a lack of competition, banks could charge higher prices for their services and earn higher profits.) Nevertheless, with only a few large banks, the failure of just one bank could have major ramifications throughout the economy. With many small banks, the failure of one would not be catastrophic. Presumably, regulators attempt to balance all these considerations by encouraging bank behavior that is beneficial to society while at the same time ensuring the safety and soundness of the financial system.

Against this background, it should not be surprising that regulators were interested in monitoring and influencing, if not controlling, the structure of the market for banking services. In particular, regulators used their powers to control entry into the market, mergers among existing firms, and branching in an effort to maintain many small firms and a so-called competitive environment, while at the same time protecting small banks from excessive competition. But, as we shall see, the regulators' attempts to maintain a competitive environment often resulted in a noncompetitive environment. Even though there were many banks, each bank was shielded from competition.

A local environment can become more competitive in several ways. One way, of course, occurs when a new institution secures a charter and sets up in competition with the local banks. Competition can also increase if existing banks located elsewhere in the state are allowed to open new branch offices in the area. Although not always the case, the vast majority of states allow statewide branching.

McFadden Act
The 1927 act by Congress that outlawed interstate branching and made national banks conform to the intrastate branching laws of the states in which they were located.

Historically, however, branching generally had to stop at the state line. The **McFadden Act,** passed by Congress in 1927, prohibited federally chartered national banks from branching across state lines. It also required national banks to abide by the branching laws of the state in which they were located. State banks that are Fed members can operate only in the state that grants them a charter. Generally, other state-chartered banks could not open branches across state lines, although some states permitted entry by state-chartered banks that were not Fed members. Although it is now history, the McFadden Act is substantially responsible for the structure of the commercial banking system we have today.

Initially, state and federal restrictions on intrastate (multiple branches within one state) and interstate branching (branches within different states) were motivated by a desire to prevent undue concentration and reduced competition in banking. For example, it was believed that with unrestricted statewide branching, a few large city banks would open branches across a state and drive the small community banks out of business. The result would be a worrisome concentration of economic and perhaps political power in a few large institutions and a reduction in the quality and quantity of financial services available in smaller communities.

Concerns about size and concentration, along with the fear that more competition in local banking markets might lead to more bank failures, resulted in restrictions on entry and branching. This, in turn, led to a large number of small banks being located in relatively small communities. Despite the alleged competitiveness, many of these institutions have faced little or no competition because larger, and perhaps more efficient, banks were prohibited from entering the local market. Thus, entry and branching restrictions ultimately served to limit competition, not increase it. In part, this is why Congress, in 1994, decided to allow interstate branching. The McFadden Act was effectively

15-4
Size Distribution of FDIC-Insured Banks as of September 30, 2008

Asset Size	Number of Institutions	Percent of Total	Cumulative Percent	Total Assets	Percent of Total	Cumulative Percent
<$100 million	2,882	40%	40%	$156,361	1.3%	1.3%
$100 mil.–$1 bil.	3,755	53%	93%	1,088,258	9%	10.3%
$1 bil. and up	509	7%	100%	10,805,794	89.7%	100.0%
Total	7,146			12,050,413		

Sources: Federal Deposit Insurance Corporation (http://www.fdic.gov) & Federal Reserve Statistical Release (http://www.federalreserve.gov)

Interstate Banking and Branching Efficiency Act (IBBEA)
Signed into law in September 1994, an act by Congress that effectively allows unimpeded nationwide branching.

abrogated in September 1994, when President Bill Clinton signed the **Interstate Banking and Branching Efficiency Act (IBBEA).** The IBBEA has effectively allowed unimpeded nationwide branching since mid-1997.

Another reason for the enactment of the IBBEA was that Congress and the president were merely following the lead of the states. In 1985, the Supreme Court gave states the freedom to form regional banking pacts. Two years later, 45 of the 50 states allowed some form of interstate banking. More importantly, as we shall see in the next section, banks had, for all practical purposes, found ways to engage in interstate branching even before the law allowing branching was passed.

As Exhibit 15-4 shows, on June 30, 2007, there were 7,146 FDIC-insured banks in the United States. Of these, 40 percent had assets of less than $100 million each. Although $100 million might sound like a lot, it is small for a bank. At the same time, over 93 percent of FDIC-insured banks had assets less than $1 billion, while about 7 percent had assets greater than $1 billion.

A look at total banking assets for the industry reveals even more. The smallest 40 percent of all banks owned about 1.3 percent of total banking assets. The smallest 93 percent of banks had about 10.3 percent of total assets. About 7 percent of all banks had assets of more than $1 billion, but they owned about 89.7 percent of total banking assets! By any measure, it is clear that the industry is composed of a large number of very small banks and a small number of very large banks. As you might guess, most of the industry giants have extensive branching networks and are located in states that had liberal branching laws long before the IBBEA. But the numbers alone conceal additional relevant attributes of the banking structure—namely, that the numbers are changing dramatically as mergers occur and that virtually all of the large banks are organized as bank holding companies or as financial holding companies. To these subjects we now turn.

Recap

The McFadden Act of 1927 outlawed interstate branching by national banks. The act required national banks to abide by the branching laws of the state in which they were located. In 1994, the Interstate Banking and Branching Efficiency Act (IBBEA) effectively allowed unimpeded nationwide branching as of June 1, 1997. Today, there are a large number of very small banks and a small number of very large banks.

BANK HOLDING COMPANIES AND FINANCIAL HOLDING COMPANIES

Bank Holding Company
A corporation that owns several firms, at least one of which is a bank.

A **bank holding company** is a corporation that owns several firms, at least one of which is a bank. The remaining firms are engaged in activities that are closely related to banking.

If the holding company owns one bank, it is called a one-bank holding company. If it owns more than one, it is called, not surprisingly, a multi-bank holding company.

Many banks organize themselves into holding companies because they expect this organizational form to be more profitable than a simple bank would be. More specifically, this corporate form allows banks to diversify into other product areas, thus providing the public with a wider array of financial services, while reducing the risk associated with limiting operations to traditional banking services. In addition, prior to 1997, organizing as a bank holding company allowed banks to circumvent restrictions on branching and thus seek out sources and uses of funds in other geographical markets.

Thus, organizing as a bank holding company allowed banks to effectively circumvent prohibitions on intrastate and interstate branching, which have now been virtually eliminated, and to participate in activities that otherwise would be barred. Such activities include data processing, leasing, investment counseling, and servicing out-of-state loans. For a summary list of activities that bank holding companies can currently engage in, see Exhibit 15-5.

Almost all large banks are owned by holding companies. In January 2009, the largest holding company is J.P. Morgan Chase, which has over $2,251 billion in assets, over 200,000 employees, and a presence in more than 60 countries. Although the list is rapidly changing due to the ongoing financial crisis, the 25 largest bank holding companies as of

15-5
Allowable Activities for Bank Holding Companies (Federal Reserve Regulation Y—Through January 2009 Revisions)

- Making, acquiring, brokering, or servicing loans, issuing and accepting letters of credit
- Real estate and personal property appraising
- Commercial real estate equity financing
- Check-guaranty services
- Collection agency services
- Credit bureau services
- Derivatives activities to transfer title to commodities underlying derivatives contracts instantaneously, on a pass-through basis
- Asset management, servicing, and collection activities
- Acquiring debt in default
- Real estate settlement services
- Leasing personal or real property
- Operating nonbank depository institutions
- Performing trust company functions
- Financial and investment advisory activities
- Providing feasibility studies
- Agency transactional services
- Investment transactions as principal including underwriting and dealing in government obligations, money market instruments, foreign exchange, forward contracts, options, futures, options on futures, swaps, and similar contracts
- Management consulting and counseling activities
- Courier services
- Printing and selling checks, deposit slips, etc.
- Insurance agency and underwriting
- Community development activities
- Issuing money orders, savings bonds, and travelers' checks
- Data processing

Process, store, and transmit nonfinancial data in connection with their financial data processing, storage, and transmission activities

Source: Federal Reserve System, http://www.federalreserve.gov/regulations/default.htm.

15-6a

Commercial Banks by Total Assets as of June 30, 2007

Rank	Bank Name	Location	Total Assts (Mil $)	Branches	
				Domestic	Foreign
1	BANK OF AMERICA, NATIONAL ASSOCIATION	CHARLOTTE, NC	1,252,402	5,835	123
2	JPMORGAN CHASE BANK, NATIONAL ASSOCIATION	COLUMBUS, OH	1,252,369	2,870	46
3	CITIBANK NATIONAL ASSOCIATION	LAS VEGAS, NV	1,132,840	1,006	365
4	WACHOVIA BK NATIONAL ASSOCIATION	CHARLOTTE, NC	524,113	3,167	12
5	WELLS FARGO BK NATIONAL ASSOCIATION	SIOUX FALLS, SD	428,724	4,076	3
6	U.S. BK NATIONAL ASSOCIATION	CINCINNATI, OH	221,026	2,836	1
7	SUNTRUST BANK	ATLANTA, GA	177,067	1,933	0
8	HSBC BK USA NATIONAL ASSOCIATION	WILMINGTON, DE	168,652	414	5
9	FIA CARD SVC NATIONAL ASSOCIATION	WILMINGTON, DE	143,218	0	1
10	NATIONAL CITY BANK	CLEVELAND, OH	138,415	1,430	1
11	REGIONS BANK	BIRMINGHAM, AL	132,667	2,203	0
12	BRANCH BANK & TRUST	WINSTON-SALEM, NC	121,998	1,431	0
13	BANK OF NY	NEW YORK, NY	108,157	8	9
14	STATE STREET BANK & TRUST	BOSTON, MA	101,555	2	10
15	PNC BK NATIONAL ASSOCIATION	PITTSBURGH, PA	93,805	953	0
16	KEYBANK NATIONAL ASSOCIATION	CLEVELAND, OH	89,930	1,159	1
17	LASALLE BK NATIONAL ASSOCIATION	CHICAGO, IL	77,062	138	1
18	CITIBANK SD NATIONAL ASSOCIATION	SIOUX FALLS, SD	76,686	0	0
19	CHASE BK USA NATIONAL ASSOCIATION	NEWARK, DE	74,073	2	0
20	COMERICA BANK	DETROIT, MI	58,668	382	1
21	BANK OF THE WEST	SAN FRANCISCO, CA	58,368	685	0
22	MANUFACTURERS & TRADERS TRUST	BUFFALO, NY	57,006	695	1
23	FIFTH THIRD BANK	CINCINNATI, OH	54,939	412	1
24	NORTH FORK BANK	MATTITUCK, NY	53,639	350	0
25	UNION BK OF CA NATIONAL ASSOCIATION	SAN FRANCISCO, CA	52,568	344	6

June 30, 2007 appear next to a list of the 25 largest banks in Exhibit 15-6a and b. Observe how the two lists overlap and see the additional assets that the bank holding companies add to the largest banks. Note that as of January 2009, J.P. Morgan Chase is the largest bank holding company and not Citigroup, which according to Exhibit 15-6b, was the largest bank holding company in June 2007.

Financial Holding Companies
Holding companies that can engage in an even broader array of financial-related activities than bank holding companies, including securities underwriting and dealing, insurance agency and underwriting activities, and merchant banking activities; financial holding companies may engage in any other financial and nonfinancial activities as determined by the Fed.

Perhaps even more dramatic is the ongoing trend for bank holding companies to convert to **financial holding companies.** Under the Gramm-Leach-Bliley Act (GLBA) of 1999, bank holding companies, securities firms, insurance companies, and other financial institutions can affiliate under common ownership to form financial holding companies. A financial holding company can offer a complete range of financial services, many of which were previously prohibited. These activities include:

- Securities underwriting and dealing
- Insurance agency and underwriting activities
- Merchant banking activities
- Any other activity that the Fed determines to be financial in nature or incidental to financial activities

15-6b
Largest 50 Bank Holding Companies by Total Assets as of June 30, 2007

Rank	Bank Name	Location	Total Assts (Mil $)
1	CITIGROUP INC.	NEW YORK, NY	2,220,866,000
2	BANK OF AMERICA CORPORATION	CHARLOTTE, NC	1,535,684,280
3	JPMORGAN CHASE & CO.	NEW YORK, NY	1,458,042,000
4	WACHOVIA CORPORATION	CHARLOTTE, NC	719,922,000
5	TAUNUS CORPORATION	NEW YORK, NY	579,062,000
6	WELLS FARGO & COMPANY	SAN FRANCISCO, CA	539,865,000
7	HSBC NORTH AMERICA HOLDINGS INC.	PROSPECT HEIGHTS, I	483,630,057
8	U.S. BANCORP	MINNEAPOLIS, MN	222,530,000
9	SUNTRUST BANKS, INC.	ATLANTA, GA	180,314,372
10	ABN AMRO NORTH AMERICA HOLDING COMPANY	CHICAGO, IL	160,341,966
11	CITIZENS FINANCIAL GROUP, INC.	PROVIDENCE, RI	159,392,731
12	CAPITAL ONE FINANCIAL CORPORATION	MCLEAN, VA	145,937,957
13	NATIONAL CITY CORPORATION	CLEVELAND, OH	140,648,168
14	REGIONS FINANCIAL CORPORATION	BIRMINGHAM, AL	137,624,205
15	BB&T CORPORATION	WINSTON-SALEM, NC	127,577,050
16	BANK OF NEW YORK COMPANY, INC.	NEW YORK, NY	126,457,000
17	PNC FINANCIAL SERVICES GROUP, INC.	PITTSBURGH, PA	125,736,711
18	STATE STREET CORPORATION	BOSTON, MA	112,345,777
19	FIFTH THIRD BANCORP	CINCINNATI, OH	101,389,721
20	KEYCORP	CLEVELAND, OH	93,490,903
21	BANCWEST CORPORATION	HONOLULU, HI	70,661,335
22	HARRIS FINANCIAL CORP.	WILMINGTON, DE	64,475,903
23	NORTHERN TRUST CORPORATION	CHICAGO, IL	59,609,734
24	COMERICA INCORPORATED	DETROIT, MI	58,945,727
25	MARSHALL & ILSLEY CORPORATION	MILWAUKEE, WI	58,327,527

- Any nonfinancial activity that the Fed determines is complementary to the financial activity and does not pose a substantial risk to the safety or soundness of depository institutions or to the financial system

Merchant Banking
Direct equity investment (the purchasing of stock) in a start-up or growing company by a bank.

Merchant banking is the making of direct equity investments (purchasing stock) in start-up or growing nonfinancial businesses. Under GLBA, financial holding companies will be able to own up to 100 percent of commercial, nonfinancial businesses as long as ownership is for investment purposes only, the financial holding company is not involved in the day-to-day management of the company, and the investment is for 10 years or less. Prior to the recent law, bank holding companies could own only 5 percent of a commercial company directly and up to 49 percent through certain subsidiaries.

To become a financial holding company, bank holding companies that meet certain criteria must file a declaration with the Federal Reserve.[8] The declaration must certify that, among other things, all of the bank holding company's depository institution subsidiaries are well capitalized and well managed. As of March 11, 2000, the effective date of the GLBA, 117 institutions were certified as financial holding companies. As of April 2008, over 647 financial holding companies were in existence.

To summarize, banks, under the holding company corporate umbrella, have been expanding the geographical areas they serve and the array of financial services they offer the public. Bank holding companies may also apply to become financial holding companies if they meet certain criteria. Under the financial holding company status,

bank holding companies, insurance companies, and securities firms can affiliate under common ownership. In addition, financial holding companies can engage in an even broader array of financial and nonfinancial services than bank holding companies can. The expansion by banks into areas traditionally served by other, more specialized, FIs has been matched (as discussed in Chapter 4) by other FIs and other nonfinancial institutions expanding into areas traditionally served mainly by banks, such as the checkable deposits offered by S&Ls and the credit cards offered by General Motors.

ONGOING CHANGES IN THE STRUCTURE OF THE BANKING INDUSTRY

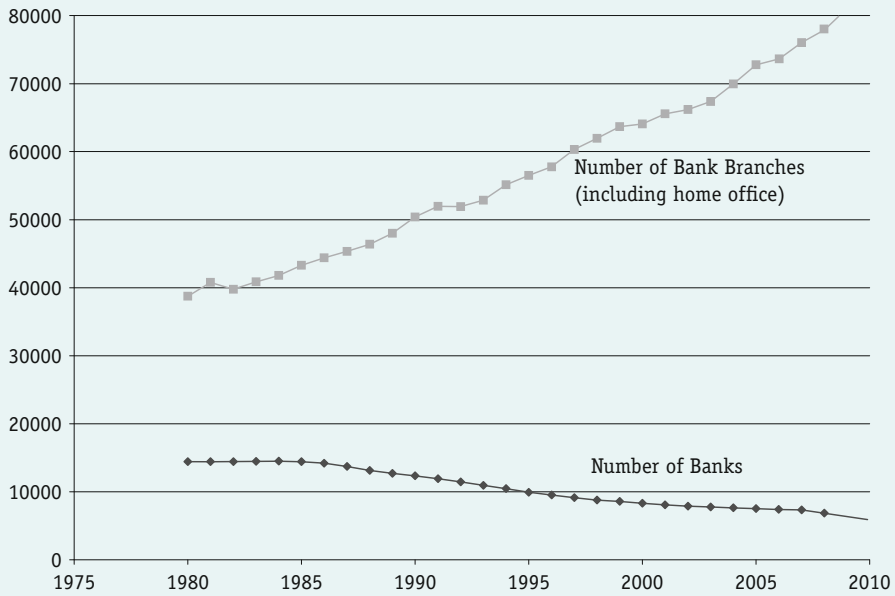
The breakdown of barriers to intra- and interstate branching and to certain activities has resulted in increased competition in the financial services industry and considerable erosion in the domain and effectiveness of many long-standing financial regulations. The changes in the structure of U.S. banking and banking laws have been revolutionary and have resulted in a drastic decline in the number of banks in the past few years. Between 1980 and 2007, over 1,465 banks failed, about 9,800 mergers occurred, and about 4,700 new banks were started. The result was a net decline in the number of banks from over 14,400 to 7,146 in late 2008. After slowing in the immediately preceding years, the movement toward integration and consolidation among financial institutions in the financial services industry has increased due to the financial crisis of 2008 and the resulting mergers and takeovers of some extremely large banking institutions such as Washington Mutual and Wachovia.

A related trend is a significant increase in the share of total bank assets controlled by the largest banks. For example, in 1980, the 100 largest banking organizations (banks and bank holding companies) accounted for about one-half of total banking assets. By mid-2007, the largest 20 banks accounted for over half of all banking assets, the top ten banks held about 44 percent of assets, and the three largest banks controlled 25 percent of assets. The increased concentration of banking assets in the largest banks has resulted from the removal of branching restrictions, particularly across state lines, and from bank mergers. Despite the decline in the number of banks, the number of branches has actually increased since 1980.

In the 1990s, the pace and dollar volume of mergers increased significantly. Some of the largest mergers that took place during the early and mid-1990s include the Chase-Chemical Bank merger, the Wells Fargo-First Interstate merger, the NationsBank-Barnett merger, and the First Union-Core States merger. Although these mergers were the largest in history up to that time, they are much smaller than the more recent mergers of Citicorp and Travelers, Wells Fargo and Norwest, Banc One and First Chicago, and NationsBank and BankAmerica. These mergers have set a new standard for sheer size in U.S. banking organizations, and have been occurring not only between banks but also, like the Citicorp-Travelers merger, between banks and other companies in the financial services industry.[9] After the early 2004 combination of JP Morgan Chase and Bank One, the pace of mergers slowed somewhat; however, this slowdown seems unlikely to be a new trend. Exhibit 15-7 shows that while the number of banks has declined since the 1990s, the total number of bank branches has continued to grow. These divergent trends reflect the importance of bank mergers The accompanying feature titled "A Closer Look" examines some of the mega-mergers of the past decade.

In the latter half of 2008, merger and takeover activity was again on the rise, primarily as a result of the weakness of some large depository institutions such as Washington Mutual and Wachovia Banks. As the financial crisis developed it became increasingly

15-7
Number of Banks and Branches, 1980–2008*



Sources: Federal Deposit Insurance Corp. (http://www.fdic.gov)
*Through June 30, 2008

evident that the structure of traditional investment banks would also not survive. Of the five largest traditional investment banks, none now exist in their original form. Bear Stearns was purchased by JPMorgan Chase, and Merrill Lynch by the Bank of America. In addition, Lehman Brothers filed for bankruptcy with part of it purchased by Barclays. Finally, Goldman Sachs and Morgan Stanley transformed themselves into bank holding companies.

Two things are certain: (1) the structure of the banking system is changing rapidly and looks far different than it looked 20 years ago; and (2) profit-seeking banks will continue to adapt to changing regulations and ever-transforming financial environments in ways that will produce further structural changes.

Finally, as we have seen, banks—under the financial holding company status—can enter the securities, insurance, and merchant banking industries and engage in other financial and nonfinancial activities as determined by the Fed. Banks were officially barred from these activities between 1933 and 2000, although many had found de facto ways into some of these areas through nonbank subsidiaries. We expect the trend for extensive financial integration and concentration to continue in the financial services industry.

THE EVOLUTION OF INTERNATIONAL BANKING

The environment for banks has also changed dramatically in the international arena. A striking increase in international borrowing and lending by domestic banks began in the 1970s with the expansion of world trade that occurred shortly after the first OPEC oil crisis.[10] Not only did the amount of international lending increase, but also the number of participating banks. Petrodollars, as they came to be known, flowed into the OPEC nations in payment for oil. In turn, the OPEC nations deposited a large part of

Mega-mergers of the Past Decade

The provisions of the Interstate Banking and Branching Efficiency Act of 1994 were fully phased in by mid-1997. After this time, mergers entered a new era, as the size, geographical area, and number of mergers increased sharply. Moreover, bank holding companies merged with other financial services firms, producing mega-financial supermarkets. Here we review four mergers that occurred during the fall of 1998:

1. As mentioned in the text, the largest bank holding company resulted from another megamerger—the merger of Citicorp and Travelers Group. The new firm, Citigroup, is the largest financial services firm in the world, with over $2,200 billion in assets in 2007 and 100 million customers in 100 countries. It can offer customers one-stop shopping for all of their financial service needs, including retail and investment (securities) banking, credit cards, brokerage services, and property, casualty, and life insurance.
2. BankAmerica Corporation of San Francisco merged with NationsBank Corporation of Charlotte, North Carolina. The merger entailed a stock-for-stock swap between the two banks valued at $60 billion. The new megabank has assets in excess of $570 billion and a network of 3,800 branches in 27 states. Both NationsBank and BankAmerica had purchased securities firms in 1997. In 1991, San Francisco–based BankAmerica had purchased Security Pacific in what, at that time, was the largest ever bank merger. In 1997, NationsBank purchased Florida-based Barnett Bank and Missouri-based Boatman's Bancshares. The combined bank—called BankAmerica—is the second largest bank holding company in the country.
3. Ohio-based Banc One Corporation and First Chicago NBD Corporation swapped $30 billion of stock in order to merge. The result was the largest retail and commercial bank network in the Midwest. The new bank—called Bank One Corporation—has over 2,000 branches and assets in excess of $275 billion.
4. Minneapolis-based Norwest Corporation merged with San Francisco–based Wells Fargo to become the nation's sixth largest bank with assets over $191 billion and operations in 21 states throughout the West and Midwest. The new bank, known as Wells Fargo, is the nation's leader in offering banking services over the Internet.

Although mergers continued at a rapid pace, the wave of mega-mergers subsided in late 1998 only to be revitalized in 2003 and 2004 with two of the largest mergers in history, which we review below.

1. On October 27, 2003, Bank of America, the third largest bank in the United States, announced that it was buying FleetBoston Financial Corporation, the nation's seventh largest bank, for about $47 billion. The new bank, with about $950 billion in assets, would be the second largest U.S. bank behind Citigroup. The merger gave Bank of America a foothold in New England, something that they had been lacking. The new bank had an estimated 180,000 employees and 5,700 branches.
2. On January 14, 2004, JP Morgan Chase, the nation's third largest bank, and Bank One Corporation, the nation's sixth largest bank, announced plans to merge in a $58 billion deal. The new bank has over $1.1 trillion in assets, over 145,000 employees, and 2,300 branches, making it the second largest bank behind Citigroup, leapfrogging over the new bank created by the Bank of America-FleetBoston merger in October

2003. JP Morgan gained access to retail banking, while Bank One gained access to investment banking.

These mergers resulted from the desire to slash costs (and often employees), boost stock prices, and offer customers more diversified services. The trend is from traditional local banks with limited services to multiregional and national banks offering customers in a wider geographical area a larger menu of services, including bank accounts, loans, and investment and insurance services.

In 2008, the ongoing financial crisis that started in the subprime mortgage market and spread to the financial system as a whole ushered in another round of megamergers. This wave involved some of the oldest, most venerable names and included both commercial banks and investment banks.

1. On January 11th Bank of America announced plans to purchase Countrywide Financial for $4.1 billion in stock, and by July the transaction was completed.
2. On March 16th JPMorgan Chase announced plans to acquire Bear Stearns & Co. Inc. in a deal arranged by the Federal Reserve. This merger was completed June 2, 2008, with Bear Stearns' stock eventually purchased for $10 a share, up from the originally announced price of $2.
3. On September 14th Bank of America announces the purchase of the huge and famous investment bank, Merrill Lynch.
4. On September 15th the investment bank, Lehman Brothers, files for bankruptcy, with a large portion of the former investment bank purchased by the third largest U.K. bank, Barclays.
5. On September 25th after being put into receivership with the FDIC, the commercial banking operations of Washington Mutual were sold to JPMorgan Chase for $1.9 billion.
6. On October 3rd Wells Fargo announced its intention to purchase the Charlotte North Carolina based financial giant, Wachovia.

This most recent wave of mergers appears quite different than the earlier ones, with the combinations being arranged by government authorities to maintain financial stability. However from the perspective of the acquiring firms the incentive to merge is ultimately based on the promise of lower costs, wider customer base, and greater revenue and increased profit.

Write Off
Officially recognize a loan to a borrower who is not repaying, and not likely to repay in the future, as worthless.

Restructure (a Loan)
Change a loan to allow a borrower who would otherwise likely default to repay (e.g., allow the borrower to pay amounts currently due at some future date instead).

these funds in U.S. and European banks in exchange for deposit claims. Many U.S. banks began to loan funds denominated in dollars to less-developed countries. In the early 1980s, a crisis arose when the less-developed countries were unable to service their loans. As a result, many large banks had to **write off** or **restructure** these loans and incurred losses that took many years to be absorbed. Consequently, the 1990s and 2000s have seen less emphasis on growth, more caution, and greater stress given to asset quality and rate of return by banks.

In addition, a large number of foreign banks had made significant inroads into U.S. markets by the 1980s. Many of these foreign banks got caught up in the same types of problem loans as domestic banks in the 1980s, however, and their growth slowed considerably. Nevertheless, foreign banks still have a major presence in the United States. On June 30, 2007, 262 foreign banks from 50 different countries operated branches or

offices in the United States. Branches of foreign banks controlled more than 19.8 percent ($1,845 billion) of banking assets in the United States. In addition, foreign banks had over 25 percent ownership interest in 68 U.S. commercial banks with about $738 billion in assets. Another 41 foreign banks operated agencies in the United States. An **agency of a foreign bank** is a more restrictive form of operation than a foreign branch in that the agency can raise funds only in the wholesale and money markets, whereas the branch of a foreign bank can accept retail deposits as well as borrow in the wholesale and money markets. An additional 149 foreign banks had representative offices in the United States.

Agency of a Foreign Bank
A U.S. banking office of a foreign bank that can only borrow funds in the wholesale and money markets and is not allowed to accept retail deposits.

Another indicator of an increase in international banking is the rapid growth in foreign office deposits of U.S. banks. In the second quarter of 2007 (April 1 to June 30), deposits in foreign offices increased by a record $143.3 billion (11.9 percent) and nondeposit liabilities increased by $128.3 billion (4.6 percent). In contrast, deposits in domestic offices declined by $3.2 billion (.05 percent).

In the 2000s, the banking system became truly international in scope. Advances in electronics and telecommunications allowed domestic and foreign bankers to participate in worldwide transactions without leaving home. Now, funds can be transmitted easily to virtually anywhere in the world. Deregulation has also made it possible for U.S. banks to open offices and enter foreign markets more easily than before, and vice versa.

In this new environment, bankers have discovered that there is tremendous competition for international transactions involving the electronic transfer of funds—and, consequently, profit margins are declining. Scores of banks from around the world can bid on loans with the result that the interest rate, and hence the return, are driven to rock-bottom levels. What appeared to be new lending opportunities have been somewhat disappointing because of the reduced profit margins. As a result, banks once again are looking to more traditional markets for expansion.

The time has come to round out our examination of commercial banking by focusing on the management of individual banks, with particular emphasis on the risks that banks face. In this way, we will gain a greater appreciation for what banks do and why.

Recap Under the holding company corporate umbrella, banks have succeeded in expanding the geographical areas they serve and the array of financial services they offer the public. Barriers to interstate branching were removed in 1997 by the IBBEA. GLBA allowed banks, securities firms, and insurance companies to affiliate under common ownership and to provide their customers with an extensive array of financial services. Since the 1980s, the number of banks has declined because of bank failures and mergers. In the 1990s and early 2000s, many mega-mergers have occurred, and banking is becoming increasingly concentrated. Banking has become truly international in scope as well.

BANK MANAGEMENT: MANAGING RISK AND PROFITS

After the ribbon is cut and the new bank or branch opens, the bank's managers swing into action. In essence, it is the bank's balance sheet—assets, liabilities, and capital—that is "managed." The decisions involve what kinds of loans are to be made, what the prime rate should be, what interest rate to offer on one-year time deposits, and so forth. These decisions reflect an interaction between the bank's liquidity, safety, and earnings objectives and the economic and financial environment within which the bank operates.

To get a clearer picture of this interaction, it is useful to visualize bank management as having to face and deal with several types of risks and uncertainties, including credit or default risk, interest rate risk, liquidity risk, and exchange rate risk. A primary function of a bank loan officer is to evaluate or assess the default risk associated with lending to particular borrowers, such as firms, individuals, and domestic and foreign governments. To do this, the loan officer gathers all the relevant information about potential borrowers, including balance sheets, income statements, credit checks, and how the funds are to be used. Banks now can use **credit derivatives** which are contracts that transfer the default risk of a loan from the bank to a guarantor who receives a fee for accepting the risk to insure that returns to assets do not fall below a certain rate.

Credit Derivatives
Contracts that transfer the default risk of a loan or other debt instrument from the bank (or holder of the loan) to a guarantor who receives a fee for accepting the risk.

Bank managers must also manage interest rate risk. As noted in Chapter 4, a positive spread today can turn into a negative spread later when the cost of liabilities exceeds the return on assets. An example will illustrate the point. Suppose LHT National Bank is about to make a two-year loan to a local restaurant. The loan officer is satisfied that the credit risk is not excessive, and an interest rate of 7 percent is agreed upon. In effect, the bank, in view of the economic and financial outlook and its existing balance sheet, plans to finance the loan by issuing ("hiring") one-year time deposits paying 4 percent. The 3 percent spread will yield a handsome gross profit over the first year. What about the second year? As a great economic philosopher once said, "It all depends." At the end of the first year, the time deposit matures, and LHT has to "rehire" the funds needed to continue financing the outstanding loan to the restaurant. If the funds can be rehired at 4 percent, the spread will not change. However, suppose that the overall level of interest rates has risen dramatically, perhaps due to restrictive policy actions being pursued by the Fed, and the bank must now pay 10 percent on one-year time deposits. The 3 percent positive spread (7 percent minus 4 percent) in the first year of the loan is exactly offset by a 3 percent negative spread (7 percent minus 10 percent) in the second year. When various administrative and processing costs are considered, the loan turns out to be quite unprofitable.

Banks can use financial futures, options, and swaps to manage interest rate risk. These three instruments are discussed in later chapters, particularly Chapter 23. **Adjustable (variable) rate loans** can also be used to hedge interest rate risk. The basic idea is quite simple. The loan contract specifies that the rate charged on a loan—be it a consumer loan, business loan, or mortgage loan—will be adjusted up or down, say, once a year, as the cost of funds rises or falls. The aim, of course, is to preserve a profitable spread and to shift the interest rate risk onto the borrower.

Adjustable (Variable) Rate Loans
Loans where the interest rate is adjusted up or down periodically as the cost of funds to the lender changes.

Going back to our example, suppose the loan contract with the restaurant calls for an adjustable rate of three percentage points above the bank's cost of funds, instead of the fixed rate originally assumed. Such an arrangement produces the same 7 percent rate in the first year (4 percent plus 3 percent), but a 13 percent rate (10 percent plus 3 percent) in the second year. In effect, the bank has succeeded in shifting the interest rate risk to the borrower.[11] It is worthwhile emphasizing here that adjustable rate loans have become an important risk management tool. In the early 1990s, interest rates on liabilities fell faster than rates on assets, resulting in record bank profits. Imagine a positive spread becoming bigger over time.[12]

Like other intermediaries, banks need to manage liquidity risk. As noted in Chapter 4, a fairly large proportion of bank liabilities are payable on demand. Checkable deposits and savings deposits are two prominent examples. Banks must be prepared to meet unexpected withdrawals by depositors and to accommodate unexpected loan demands by valued customers. The resulting need for liquidity can be satisfied by holding some highly liquid assets, such as Treasury bills or excess reserves, or by expanding particular types of liabilities as needs develop. One way to expand liabilities is to attract large negotiable CDs, possibly by offering higher rates than those offered by the

competition. Other ways are to borrow more reserves from the Fed's discount facility or in the federal funds markets, or to increase borrowing in the repurchase agreements or overnight Eurodollar markets.

Finally, because banking has become more international in scope, some banks maintain stocks of foreign exchange that are used in international transactions and to service customers who need to buy or sell foreign currencies. If the exchange rate between two currencies changes, the value of the stocks of foreign exchange will also change. Thus, a bank, like any holder of foreign exchange, is subject to an exchange rate risk. As we shall see in Chapter 23, banks and other holders of foreign exchange now use exchange rate forward, futures, option, and swap agreements to hedge this risk.

BANK PERFORMANCE

Banks are facing increasing competition from other FIs and other nonfinancial corporations in a global environment. They have confronted a volatile economic and regulatory environment. In the face of such challenges, bank profitability, which was low in the 1980s, improved significantly in the 1990s. The strong profits were attributed to the strong economy that reflected favorably on bank assets, low interest rates, and growing sources of noninterest income.[13] Most analysts ascribed the better performance by banks to their more diversified portfolios and to their environment. The problem loans to less-developed countries such as Mexico, Brazil, and Argentina, which caused major loan losses for many large banks in the 1980s, were resolved. Banks have shored up capital due to new regulations. All of these factors led to record profit levels and high bank stock valuations.

Bank stocks performed below average in the late 1980s but did very well in the early 1990s and extremely well in the late 1990s. In the early 2000s, bank stocks declined as a result of the overall collapse of stock prices and the faltering economy. In the years following the 2001 recession, banks did quite well. By 2007 bank stock prices had surpassed their 1998 peak as the banking system became more profitable in the recovering economy. Up until 2007, the FDIC was reporting that the number of problem banks was declining and FDIC reserves for losses far exceeded that prescribed by law.[14] This changed dramatically in 2008 as bank profits plummeted. Although the financial crisis was centered in investment banking and insurance, commercial banks were adversely impacted as well with increased bank failures. As the crisis continued to unfold in early 2009, many of the nation's largest banks needed to be bailed out by the government.

Another major challenge facing banks as we enter the second decade of the new millennium is competition from other intermediaries and other nonfinancial companies that have taken an increasing share of intermediation. These **nonbanks,** as they have come to be called, face less regulation and, often, lower costs. Costs may be lower because nonbanks are less regulated than banks are with regard to what they can do and where they can locate. In addition, nonbanks do not face reserve requirements; nor do they have to maintain full-service branches. Banks' share of total intermediation is declining. Banks must increasingly adapt to a changing industry to maintain profits as well as to maintain market share. It is no wonder that banks are merging with other financial services firms including savings and loans, securities firms, and insurance companies, and expanding into areas previously prohibited to banks. One thing that is also clear is that the profitability and structure of the banking sector will be significantly altered as regulators, Congress, broad financial markets, and the economy at large work through the ongoing financial crisis of 2008.

Nonbanks
Other intermediaries and nonfinancial companies that have taken an increasing share of intermediation.

In the next chapter, we look at savings associations and credit unions, the remaining depository institutions.

Recap Bank management must deal with default risk, interest rate risk, liquidity risk, and exchange rate risk. Banks made record profits in the 1990s; then, after performing poorly in the early 2000s, resumed their upward trend until reaching a peak in 2007. Despite record profits over this period, banks' share of intermediation continued to decline. In 2008, bank profits and stock prices fell sharply, due to the ongoing financial crisis.

Summary of Major Points

1. Banking is a heavily regulated industry. Regulatory policy aims at promoting competition and efficiency, while preserving the safety and soundness of institutions. The Glass-Steagall Act of 1933 was enacted in response to the financial collapse of the Great Depression. The law established interest rate ceilings that could be paid to depositors, separated investment and commercial banking, and created the FDIC.
2. Banks in the United States are chartered by either the federal government or one of the 50 state governments. Federally chartered banks are called national banks and must belong to the Fed and subscribe to FDIC deposit insurance. State-chartered banks can, if they choose, belong to the Fed and/or subscribe to FDIC insurance. In fact, nearly all banks subscribe to FDIC insurance. Although only about 26 percent have federal charters and belong to the Fed, these banks tend to be the largest and have the most assets and banking offices.
3. The McFadden Act outlawed interstate branching by national banks. With regard to intrastate branching, the act required national banks to abide by the branching laws of the state in which they were located.
4. Restrictions were imposed on entry and branching as a result of fears that (1) more competition in local banking markets might lead to more failures and (2) letting big city banks enter markets served by small community banks might result in an unwanted concentration of power, to the detriment of smaller communities far from financial centers. These restrictions have resulted in a banking structure in which a large number of small banks control a small portion of total banking assets and a small number of large banks control the bulk of total banking assets. Many bank mergers occurred in recent years—some of them between banks and other financial services firms. Banking is becoming more heavily concentrated. As of June 1, 1997, the Interstate Banking and Branching Efficiency Act (IBBEA) of 1994 effectively allowed unimpeded nationwide branching. With the passage of the Gramm-Leach-Bliley Act of 1999, banks, securities firms, and insurance companies have been able to affiliate under common ownership and to offer the public a vast array of financial services under one umbrella since early 2000.
5. Under the holding company corporate umbrella, banks have been expanding the geographical areas they serve and the array of financial services they offer the public. The expansion by banks into areas traditionally served by other, more specialized, FIs has been matched by other FIs and nonfinancial institutions expanding into areas traditionally served mainly by banks. The result has been more competition in the financial services industry and considerable erosion in the domain and effectiveness of many long-standing regulations. Under GLBA, bank holding companies can be certified as financial holding companies. In addition to banking, financial holding companies can engage in securities underwriting and dealings, insurance activities, merchant banking activities, and other financial and nonfinancial activities determined by the Fed.
6. Banking has become internationalized as U.S. banks have increased their participation in international lending and domestic banks have faced competition from foreign banks. Branches of foreign banks now own over $1,845 billion or over 19 percent of U.S. banking assets. Electronic and telecommunication advances have helped to increase the competitiveness of international lending, thereby reducing the profit margin.
7. Bank managers supervise a bank's balance sheet. In the process, they have to face and deal with default risk, interest rate risk, liquidity risk, and exchange rate risk.

8. Regulators periodically audit (examine) banks. Conducting more of a management appraisal than a financial audit, the examiners pay particular attention to the quality of a bank's assets and, thus, how the bank is managing risk.
9. In the early 1990s, the cost of liabilities fell faster than the earnings on bank assets, resulting in record profits. The record profits continued into the late 1990s due to the strong economy, low interest rates, and increases in noninterest income. Bank stocks stumbled in the early 2000s but resumed an upward trend through 2007, surpassing previous highs. By 2008 the financial crisis was reducing bank profits and stock prices. A record number of vary large banks ran into difficulties, and were taken over by another institution.

Key Terms

Adjustable (Variable) Rate Loans, p. **373**
Agency of a Foreign Bank, p. **372**
Bank Holding Company, p. **364**
Bank Runs, p. **357**
Chartered, p. **358**
Comptroller of the Currency, p. **358**
Credit Derivatives, p. **373**
Dual Banking System, p. **358**
Federal Deposit Insurance Corporation (FDIC), p. **357**
Federal Financial Institutions Examinations Council (FFIEC), p. **360**
Financial Holding Companies, p. **366**
Glass-Steagall Act of 1933, p. **357**
Interstate Banking and Branching Efficiency Act (IBBEA), p. **364**
McFadden Act, p. **363**
Merchant Banking, p. **367**
National Bank, p. **358**
Nonbanks, p. **374**
Regulation Q, p. **357**
Restructure (a Loan), p. **371**
Solvent, p. **360**
Write Off, p. **371**

Review Questions

1. We have stressed that the goals of efficiency and competition may conflict with the goals of safety and soundness. Give an example of when this could occur.
2. What is meant by a dual banking system?
3. What is a bank holding company? Why have most large banks become bank holding companies? What is a financial holding company? What must a bank holding company do to become a financial holding company?
4. What are the two major provisions of the McFadden Act? What was the motivation behind its passage?
5. What is the IBBEA? What was the motivation behind its passage?
6. How did multibank holding companies "get around" the McFadden Act before the passage of the IBBEA? Defend the following statement: The IBBEA did nothing more than endorse what was happening in the marketplace.
7. Critique the following statement: Since there are over 7,100 commercial banks in the United States, banking is obviously a highly competitive industry.
8. What is interest rate risk? Explain several ways that banks can reduce interest rate risk.
9. What is liquidity risk? Discuss ways in which banks deal with this risk. Does the development of nondeposit liabilities increase or decrease liquidity risk?
10. Identify two factors that have contributed to the growth of international banking. What factors contribute to reduced profit margins in this area?
11. Discuss the factors that have contributed to the revolutionary changes in the structure of U.S. banking in recent years. Which factors are most important? Could regulators have prevented many of the changes?
12. Will the revolutionary changes in banking increase or decrease the competitiveness of the industry? Why?
13. Discuss the following statement: The breakdown of barriers to interstate and intrastate banking means that competition in banking is decreasing.
14. What is the difference between a bank holding company and a financial holding company?
15. What is merchant banking?

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

✓16. On September 30, 2008, what percentage of bank assets did the smallest 40 percent of banks control? What percentage of bank assets did the largest 7 percent of banks control?

✓17. Use Exhibit 15-1 to calculate the following:

a. What percentage of state banks are members of the Fed?

b. What percentage of banks are members of the Fed? What percentage of total deposits do they hold?

c. What percentage of total assets do national banks own? What percentage of total deposits is in national banks?

d. What percentage of total assets do state banks own?

Suggested Readings

For a great book on banking consolidation, see Gary A. Dymski, *The Bank Merger Wave: The Economic Causes and Social Consequences of Financial Consolidation* (Armonk, NY: M.E. Sharpe, 1999). Adam M. Zaretsky wrote a recent article on the same subject titled "Bank Consolidation: Regulators Always Have the Power to Pull the Plug," *The Regional Economist*, Federal Reserve Bank of St. Louis, January 2004.

For an interesting discussion of U.S. banking regulation and structure, or to ask your own question regarding the material in this chapter, see "Ask Dr. Econ," Federal Reserve Bank of San Francisco, available at: **http://www.frbsf.org/education/activities/drecon/askecon.cfm.**

For an in-depth look at technological advances in finance with special emphasis on the role of banks, see Jamie B. Stewart, Jr., "Changing Technology and the Payment System," *Current Issues in Economics and Finance*, Federal Reserve Bank of New York, 6, no. 11 (October 2000).

For a current look at bank profitability and other issues, see Til Schuerman, "Why Were Banks Better Off in the 2001 Recession?" *Current Issues in Economics and Finance*, Federal Reserve Bank of New York, 10, no. 1 (January 2004), and Alan Greenspan, "*The State of the Banking Industry*" Testimony Before the Committee on Banking, Housing, and Urban Affairs, U.S. Senate, April 20, 2004, **http://www.federalreserve.gov/boarddocs/testimony/2004/20040420/default.htm.**

Another interesting article is Robert R. Bliss and Mark J. Flannery, "Market Discipline in the Governance of U.S. Bank Holding Companies: Monitoring vs. Influencing," Working Paper No. WP-00–3, Federal Reserve Bank of Chicago (March 2000).

For a fascinating article about the sometimes harrowing experiences of a bank examiner, see David Fettig, ed., "Follow the Money," *The Region* 12, no. 2 (June 1998): 16–21, published by the Federal Reserve Bank of Minneapolis.

For a discussion of the trends likely to influence banking, see Dev Strischek, "Commercial Lending and Lenders in the 21st Century," *Journal of Lending and Credit Risk Management* 80, no. 12 (August 1998): 16–22.

For a glimpse into the future, see Robert T. Parry, "Financial Services in the New Century," *Federal Reserve Bank of San Francisco Economic Letter*, No. 98–15 (May 8, 1998).

For an interesting discussion of bank mergers, see Y. Amihud and G. Miller, eds., *Bank Mergers and Acquisitions* (Amsterdam: Kluwer Academic Press, 1998).

The Regulation and Supervision of Banks, Maximilian J.B. Hall, ed. (Northampton, MA: Edward Elgar, 2001), is a four-volume collection of 124 articles that span from 1973 to 1998.

For a look at "The Emerging Role of Banks in E-Commerce" see John Wenninger's article by the same name in *Current Issues in Economics and Finance*, Federal Reserve Bank of New York, 6, no. 3 (March 2000).

Two books that examine banking systems abroad may also be of interest. See *Islamic Banking*, by Mervyn K. Lewis and Latifa M. Algaoud (Northampton, MA: Edward Elgar, 2001), and *Banking and Financial Stability in Central Europe*, by Karl Petrick and David M.A. Green (Northampton, MA: Edward Elgar, 2001).

Endnotes

1. Subsequent research has seriously questioned this analysis. For example, it appears that the banks that were paying the very highest rates on deposits prior to the Great Depression were not the most likely to fail.
2. In addition, the applicant must be free of a criminal record.
3. In 1989, the FDIC was also given the responsibility of insuring the deposits of savings associations (S&Ls and savings banks) that wished to join. At that time, the FDIC was divided into two parts. The Bank Insurance Fund (BIF) insured commercial bank deposits of member banks, while the Savings Association Insurance Fund (SAIF) insured deposits of member savings associations. In 2006, BIF and SAIF were merged into one deposit insurance fund.
4. In 1985 some state- (as opposed to federally) insured S&Ls in Maryland and Ohio experienced "runs." Individual financial intermediaries, such as Indy Mac Bank, Washington Mutual, and Wachovia experienced runs in mid-2008, but these seemed firm-specific and concentrated among depositors with insured deposits in excess of $100,000 in one institution. Federal deposit insurance has proven effective in preventing any generalized run against the whole commercial banking system.
5. The FFIEC also prescribes uniform principles, standards, and report forms for the federal examination of savings and loans and credit unions.
6. In addition to what appeared to be lax regulation, many banks had problems during years of prosperity because leveraging was high and bad loans had been made to developing countries.
7. Note that this argument is in sharp contrast to one of the reasons given for the wave of bank mergers in recent years. Presumably, because of technological advances that began in the 1990s, large banks now can be more efficient than small ones. A recent study suggests, however, that most economies of scale are exhausted by the time banks reach the size of $10 billion to $25 billion in assets, which is certainly small by today's standards.
8. Banks that are not bank holding companies may apply simultaneously to become bank holding companies and financial holding companies.
9. This merger actually occurred prior to the passage of the Gramm-Leach-Bliley Act. Because it involved the merger of a bank and an insurance company, it would not have been legal without the ultimate passage of the GLBA.
10. OPEC stands for the Organization of Petroleum Exporting Countries, a cartel dominated by the Middle Eastern oil-producing nations.
11. Note that even though the interest rate risk for the bank has been reduced, default risk increases because the borrower is less certain of future payment obligations.
12. In a falling interest rate environment, a bank heavily into adjustable loans would be worse off than one that contracted at fixed rates on its assets.
13. In the early 1990s, profits rose mostly as a result of falling interest rates on liabilities, which lowered the cost of borrowing. The return on bank assets was also falling during the 1990s, but the cost of liabilities was falling faster, which resulted in increased profits.
14. The poor performance in the 1980s reflected troubled loans, which included loans to less-developed countries, and energy and commercial real estate loans. Concerns about the safety of the financial services industry, given the general climate surrounding the savings and loan crisis, were also quite prevalent.

CHAPTER SIXTEEN 16

One question had to do with whether my financial support in any way influenced several political figures to take up my cause. I want to say, in the most forceful way I can, I certainly hope so.

—Charles Keating

Savings Associations and Credit Unions

Learning Objectives

After reading this chapter, you should know:

The origins, purposes, and recent trends in thrifts—mutual savings banks, savings and loans, and credit unions

The risks faced by thrifts and how they manage these risks

The similarities and differences among the sources and uses of funds for savings associations and credit unions

The primary causes of the S&L crisis of the late 1980s, the regulatory attempts to address it, and its relevance for the current mortgage crisis

SAVINGS, MORTGAGES, AND THE AMERICAN DREAM

Homeownership has long been a part of the American dream. Although you may not yet own your own home, you likely know someone who does. Perhaps you have even watched as your parents, siblings, or friends have gone through the home purchase process. In order to purchase a home, one needs first to organize his or her financial affairs, accumulate savings to make a down payment, and then go to a bank to be pre-qualified or pre-approved for a loan.[1] The next step is to search for a home in one's price range with a realtor or, increasingly, through the many real estate Web pages on the Internet. The process can be intimidating and especially frustrating for those with spendthrift habits, a credit history blemished by too much credit card debt, or a record of late payments. Nevertheless, most Americans today own their own homes. During the economic expansion of the 1990s, homeownership rates rose steadily. As the Department of Housing and Urban Development recently noted, the percentage of households owning their own homes increased from 64 percent in 1993 to 67.8 percent by the first quarter of 2008. However, it has not always been this way.

Many of us take for granted the savings institutions we use to set aside funds, to apply for mortgage loans, or to meet our other consumer lending needs. It is hard to imagine that less than 200 years ago, working-class Americans had few alternatives to deposit the savings they had amassed or to borrow the funds they needed for home purchases or other consumer credit needs. Commercial banks of the era were, for the most part, just that—commercial banks. They took commercial business deposits and made commercial business loans. The homebuyers of the early 1800s not only had to save and borrow like we do, but many of them also helped create and manage the financial institutions used to hold their savings, grant their mortgages, and meet their other borrowing needs. A strong democratic, cooperative, and—in some cases—philanthropic impulse aided these pioneers in creating local savings banks, savings associations, and credit unions.

Since their inception, savings associations and credit unions have continued to evolve. Savings associations lost their nonprofit status during the 1950s as their operations expanded. Commercial banks have gone to court to challenge the nonprofit status of credit unions for similar reasons. The high and persistent interest rates of the late 1970s and early 1980s challenged the existence of savings associations (a challenge hundreds failed to meet), changed the risks these lenders faced, exposed problems in the regulatory structure, and forced lenders, legislators, and regulators to adapt to changing circumstances. One notable change in this evolutionary process has been the manner in which lenders manage home mortgages. In the past, lenders (primarily savings associations) made mortgage loans and held them until maturity. The interest revenue generated was the primary source of revenue for the lenders. As you learned in Chapter 14, in recent years lenders became more likely to make mortgage loans and resell them in the secondary mortgage market. Instead of relying on interest income, lenders increasingly came to rely on fee income generated from loan processing. Recent difficulties in markets for mortgage-backed securities and the establishment of a conservatorship for Fannie Mae and Freddie Mac in September of 2008 suggest that this development may have been temporary. In the future, savings and loan associations and other lenders may be more likely to hold the mortgage loans they make rather than sell them to others.

Chapter 4 introduced you to financial institutions and financial conglomerates. In this chapter, we will take a closer look at thrifts:[2] savings banks, savings and loans, and credit unions. We begin by describing savings associations (savings banks and savings and loan associations), why they were created, how they compare to each other, and how they are distributed by asset size. We also describe trends in their number and size, the ways they raise and use funds, and the ways they manage risk. We look at the savings and

loan crisis of the 1980s and regulatory changes that played a part in encouraging and resolving the crisis. We then relate this crisis to the subprime mortgage meltdown, which began in 2007 and became a crisis in the general mortgage market in 2008. Finally, we discuss credit unions—their history and regulation, size distribution, trends, sources and uses of funds, and management of risk.

SAVINGS ASSOCIATIONS

History and Regulation

The early 1800s were a tough time for working-class people to find a place to store funds or obtain a home mortgage. Providing depository and lending services to the nonwealthy was perceived by bankers and entrepreneurs as an expensive and unprofitable proposition. Nevertheless, the financial needs of this class did not disappear. In response to growing needs, an absence of commercial interest, and a sense of philanthropy, businesspeople, and, sometimes, clergy took it upon themselves to create local savings associations. These savings associations were created to encourage personal thrift by generating returns for depositors. They took two forms in the United States: savings banks and savings and loan associations (S&Ls). Congressional legislation allowed for the state-level chartering of mutual savings banks in 1816 followed by chartering for savings and loans in 1831. Federal chartering of savings and loans came first in 1933. Savings banks had to wait until 1978 for federal chartering approval. Congress hoped that state and federal chartering of these institutions would provide a reliable source of local funding for families who wanted to buy a home. A review of savings association history shows that this hope has been largely realized.

Since the early 1880s, state-chartered savings banks and S&Ls weathered the ups and downs in the business cycle with varying degrees of success and were left relatively unregulated. The despair and disruption accompanying the Great Depression led financial regulators to write regulations that compartmentalized the financial services industry to reduce competition and enhance safety and soundness. Hence, insurance companies were to specialize in insurance, banks in commercial loans, and savings associations in mortgage lending. In addition, depository institutions were restricted from branching within and across state lines and limited in the interest rates they could charge to borrowers or offer to savers.

Between 1932 and 1934, a series of legislative acts were passed to address the specific needs of savings associations. These acts allowed for the federal chartering of S&Ls, created a federal savings association oversight board, and provided deposit insurance. The regulatory structure coming out of these acts established the **Federal Home Loan Bank Board** (FHLBB) and its network of 12 regional home loan banks. This network created a flexible source of credit to meet the liquidity needs of member institutions engaged in home mortgage lending. The FHLBB also served as the primary regulator of federally chartered savings associations. In 1934, Congress created the **Federal Savings and Loan Insurance Corporation** (FSLIC) to insure savings association deposits in the same way the FDIC serves commercial banks. These institutions and accompanying regulations served the industry and the needs of homebuyers well until the late 1970s. After this time, the industry faced a severe crisis that will be discussed shortly.

Federal Home Loan Bank Board (FHLBB)
The primary federal regulatory agency for savings associations from 1932 until 1989; replaced by the Office of Thrift Supervision (OTS).

Federal Savings and Loan Insurance Corporation (FSLIC)
The federal agency that insured the deposits of member savings associations from 1934 until 1989; replaced by the FDIC's Savings Association Insurance Fund (SAIF).

Today, savings associations remain second only to commercial banks in terms of savings deposits and asset holdings. Mortgage brokers and commercial banks have significantly increased their share of mortgage loans originated and have eliminated the supremacy that savings associations once had. However, savings associations have continued to play an important role in the home mortgage origination process, a role that seems likely to expand in the near future.

Savings Banks

The famous English author Daniel DeFoe is credited with originating the concept of the savings bank. In 1697, he suggested the organization of "Friendly Societies for Provident Habits in General." The first Friendly Society, however, was not created for almost 70 years and the term "savings bank" was not applied until 1810. The first savings bank was established in 1810 by a Scottish clergyman, the Reverend Henry Duncan, for his parishioners in Ruthwell Village, Dumfrieshire, Scotland.[3] Its purpose was to encourage the poor and the working class to save and thereby reduce poverty.

The concept of a savings bank and its charitable objectives was transferred to the United States six years later. In 1816, Congress allowed savings bank charters, and The Philadelphia Savings Fund Society began operations as the first **mutual savings bank** in the United States. Others followed thereafter. These original savings banks were formed as "mutuals." A mutual savings association or savings bank does not issue capital stock, but instead is owned and controlled by its savings depositors and, in some cases, by its borrowers. Owners, called "members," do not usually receive a share of the profits, but do exercise other ownership rights such as electing the board of governors. Today, roughly two-thirds of the savings banks retain this form of ownership, while one-third have sold stock and converted their ownership to **stock savings banks.** Mutual savings banks are chartered in only 17 states, mostly on the East Coast of the United States. Sixty percent of all of these are located in New York and Massachusetts. Mutual savings banks continue to promote savings deposits by individuals and use these funds primarily to make residential mortgage loans, to purchase government and corporate securities, and to offer other banking services.

Mutual Savings Bank
Savings banks that lack stockholders and whose assets are managed to benefit its collective owners—present and future depositors.

Stock Savings Bank
A type of savings bank charter in which ownership is held by the stockholders.

Savings and Loan Associations (S&Ls)

Like their savings bank companions, savings and loan associations (S&Ls) were created to assist their members in saving and attaining that essential element of the American dream—homeownership. Their express purpose was to pool the savings of local residents to finance the construction and purchase of homes. The first S&L established in the United States was the Oxford Provident Building Association in Frankfort, Pennsylvania, in 1831. Oxford Provident was originally organized as a self-terminating mutual institution. To ensure loan quality, membership and loans were geographically limited to a 5-mile radius of Frankfort, Pennsylvania. In these early associations, shareholders were encouraged to leave their funds in the institution until all members had an opportunity to purchase a home. To withdraw funds earlier, one month's notice was required and a 5 percent penalty was applied. After everyone in the building or savings association had an opportunity to purchase a home, the association was dissolved.

These early savings and loans functioned more like modern-day mutual funds than like the S&Ls of today. Mutual funds consist of a pool of funds taken from a variety of investors and used to buy a diverse selection of stocks and bonds. In a similar manner, these early building associations or S&Ls pooled the funds of a variety of "investors" to buy local mortgages. The repayment of mortgages with interest generated the incentive for investors to participate.

As savings and loans expanded in number and geographic location, institutions began to operate on a perpetual basis. Over time, the concepts of "saving" and "loaning" became viewed as separate services. Those who came to save were not necessarily those who came to borrow. Similarly, those who came to borrow did not necessarily come to the institution to save. Institutions also began to accept new members, first on a periodic (quarterly, semiannual, or annual) basis and then on a daily basis. Over time, regu-

lations and insurance were provided to protect consumers. Following World War II, S&Ls spread rapidly with the growth of new housing construction, but many failed during the 1980s. In the following two decades the total number of savings and loans fell, but the total value of their assets grew, reflecting an increase in the average size of remaining S&Ls.

Savings and Loans Versus Savings Banks

There are a few differences between savings and loan associations and savings banks:

1. S&Ls are located throughout the country whereas savings banks are located predominately on the East Coast.
2. Deposits in most S&Ls are insured by the Savings Association Insurance Fund, which is administered by the Federal Deposit Insurance Corporation. In contrast, some savings banks are insured by state insurance fund programs.
3. On average, savings banks hold a slightly smaller share of their assets in home mortgages as compared to S&Ls.
4. Savings banks are typically larger than S&Ls in terms of assets and deposits.

Nevertheless, the similarities between S&Ls and savings banks are much greater than their differences. The central mission of both types of institutions is to encourage thrift and to fund home purchases. This creates similar asset and liability structures—both raise funds from the same types of deposit accounts and use these funds for mortgages or mortgage-backed securities. Both types of institutions can be either state or federally chartered. At the federal level, they share the same primary federal financial regulator, the **Office of Thrift Supervision** (OTS), and the same insurer, the Federal Deposit Insurance Corporation (FDIC). Given these similarities between savings banks and S&Ls, it seems useful to group them together for purposes of analysis and discussion.

Office of Thrift Supervision (OTS)
An agency created by the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) to replace the Federal Home Loan Bank Board as the overseer of the S&L industry.

Distribution of Insured Saving Institutions

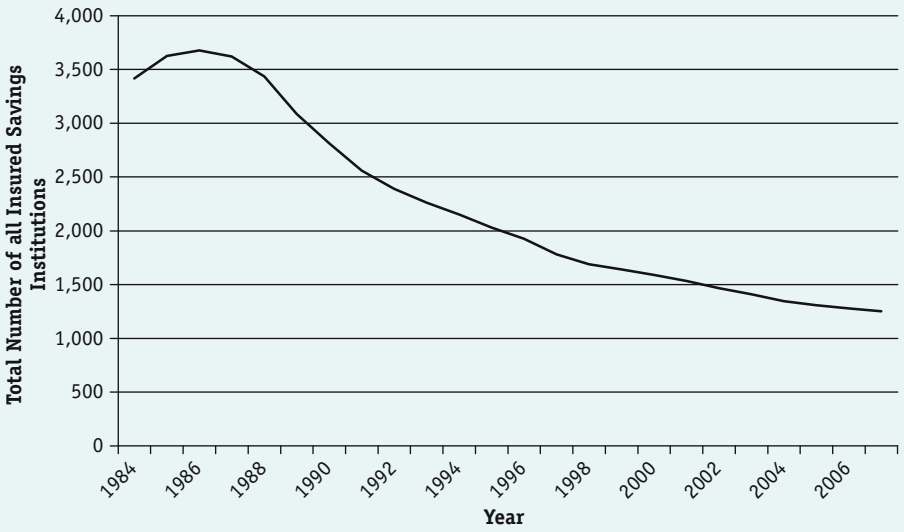
Exhibit 16–1 shows the distribution of federally insured savings institutions by asset size. On June 30, 2009, there were 1,200 insured savings institutions holding assets of over $1.4 trillion. The majority of these institutions—1,035, or over 86 percent—had assets of less than $1 billion. In contrast, the largest 165 institutions making up 13.8 percent of the industry had an asset size of $1 billion or more. They controlled $1,142.5 billion of the $1,406.4 billion (or 81.2 percent) of the total saving institution assets. Further, the largest 44 institutions—3.7 percent—had an asset size of $5 billion or more and controlled

16-1
Distribution of Insured Savings Institutions by Asset Size, 2006

	Numbers of Institutions		Assets (in billions of dollars)	
	Number	Percent	Number	Percent
Total	1,200	100.0	1,406.4	100.0
Less than $100 million	328	27.3	17.4	1.2
$100 million to $1 billion	707	58.9	247.5	17.6
$1 billion to $5 billion	121	10.1	235.5	16.7
Greater than $5 billion	44	3.7	906.0	64.5

Source: U.S. Federal Deposit Insurance Corporation.

16-2
Number of Insured Savings Institutions 1984–2007



Source: FDIC Historical Statistics on Banking, May 2008.

64.5 percent of total savings institution assets. Thus, most savings associations are small (less than $1 billion in assets). However, most savings institution assets (76.8 percent) are controlled by the 44 largest savings institutions that have over $5 billion in assets.

Recent Trends

Between 1984 and 2000, the number of insured savings associations fell by more than half, but since 2000 this rate of decline has moderated. Exhibit 16–2 shows that in 1984, there were 3,418 insured savings institutions operating in the United States. By 2000, this number had fallen to 1,590 and by the end of 2007 it was 1,279. Although new savings institutions continue to open, existing institutions merged with other savings institutions or converted to commercial bank or credit union charters.

During this period of consolidation from 1984 to 2007, the average size of savings associations continued to increase. In 1984, total assets for the industry stood at a little over $1.1 trillion and there were 3,418 institutions. This meant that the average savings institution had an asset size of nearly $335 million. By 2007, the industry had total assets of over $1.7 trillion, spread out over 1,279 firms. Thus, the average savings institution in 2007 had an asset size of about $1.38 billion. In short, savings institution nominal assets have increased significantly between 1984 and 2007 while the number of institutions has fallen. The result is that savings associations on average have more than quadrupled in nominal size since the mid-1980s.

In the mid-1990s, the assets of S&Ls were more than three times larger than those of savings banks. Nevertheless, as mentioned earlier, their assets and liabilities have a similar composition and, since the institutions share other commonalities, we have lumped S&Ls and savings banks together as savings associations for purposes of this discussion.

As first discussed in Chapter 4, the major sources of funds for savings associations are time, savings, and checkable deposits. As is the case with commercial banks, most deposits are insured for up to $100,000 ($250,000 until at least the end of 2009). Savings associations were first allowed to issue negotiable order of withdrawal (NOW) accounts (interest-earning checkable deposits) nationwide in 1980. Checkable deposits make up a

growing source of funds for savings associations. They use the funds mainly to acquire mortgage loans, and to a much lesser degree, U.S. government securities.

Although they still specialized in mortgage lending, savings associations diversified somewhat during the 1980s into other forms of lending that were previously prohibited by regulations. Other regulatory changes allowed the institutions to offer time deposits with rates that went up and down with rates on money market instruments, such as Treasury bills.

Prior to the 1980s, savings associations were not only prohibited from offering checkable deposits, but the rates they could pay on time and savings deposits were not

Looking Out

Savings Institutions in Other Countries

In the United States, thrifts serve as important institutions for encouraging and managing consumer saving. In other countries with other needs, risks, and regulatory structures, different institutions are used to meet citizens' savings needs.

The state-owned postal savings system in Japan was founded in 1875 to offer a risk-free place for small savings. Savers deposit their funds at the local post office. The funds are then used to finance government infrastructure projects and other government spending, rather than consumer loans or mortgages as in the United States. By offering branches in even the smallest villages, the Japanese postal system has, according to *The Economist,* become the "world's biggest repository of private savings." Since it is controlled by the state, the postal system can offer higher interest rates than those offered by commercial banks. It also guarantees higher interest rates for 10 years and charges no penalty for early withdrawal. The accounts are understandably popular with consumers because of their convenience, return, and safety. Since Japan's 1996 "big bang" of financial deregulation, the Japanese postal system has faced pressure from private banks to pursue privatization and its alleged efficiencies.

The United Kingdom has mutually owned building societies similar to U.S. savings and loan associations. Until very recently, the building societies were the main lender of mortgages. They have come under pressure to be more competitive and many are converting from mutual building societies to stockholder-owner banks. Many of the building societies are becoming banks to prevent customers from leaving them in search of higher returns. People have been using traditional savings accounts less and turning to riskier forms of investment. The result has been a diminished share of the mortgage market for Britain's building societies.

Sources

"Japanese Finance—Sleeping with the Enemy," *The Economist,* 355, no. 8167, April 22, 2000, p. 73; "Public Affairs: Building Societies," *The Economist* (Britain) 338, no. 7951, February 3, 1996, p. 67(1); "Japan's Dangerous Post Office" (editorial), *The Economist,* 333, no. 7887, October 29, 1994, p. 20 (2).

allowed to exceed an interest rate cap. This cap was set by Regulation Q, which put a ceiling on the maximum interest rate that could be paid on deposits. Commercial banks also faced this cap, but to assist savings associations and encourage homeownership, this cap was set one-half percentage point higher to make their deposit products more attractive to savers. In this earlier environment, small savings deposits were the major source of funds for savings associations. Small savers found passbook savings accounts attractive relative to the alternatives available to them. The accounts were liquid, safe, insured stores of value with fixed interest rates. In the new environment, savings associations have more flexibility and offer the public more diverse types of liabilities. As a result, there is more competition among banks, S&Ls, and savings banks to attract checkable and flexible rate time deposits, and the earlier caps on deposits have been eliminated for all institutions.

Recap Thrift institutions consist of savings associations (savings banks and S&Ls) and credit unions. All were created to encourage thrift and provide a place for the nonwealthy to accumulate savings and provide home purchase financing. The similarities between S&Ls and savings banks are much greater than their differences. The central mission of both types of institutions is to encourage thrift and to fund home purchases. Over 86 percent of all savings associations have assets of less than $1 billion. However, the largest 44 savings institutions with assets over $5 billion control more than 64 percent of all savings association assets. Since the mid-1980s, the number of savings associations has fallen by half while the average size of savings associations has quadrupled. The major sources of funds for savings associations are time, savings, and checkable deposits. The major uses of funds are for mortgage loans and U.S. government securities.

Savings Association Management of Risk

All financial intermediaries face varying degrees of default, interest rate, liquidity risk, and exchange rate risk. Since savings associations, in general, do not engage in transactions that involve foreign exchange, exchange rate risk is usually minimal. Therefore, we focus on how savings associations manage these three other types of risk.

Default, or credit, risk is the probability of a debtor not paying the principal and/or interest due on an outstanding debt. Savings associations are most exposed to default risk when making mortgage loans. One underlying facet of mortgage loans is that they require the loan be secured by land and real property. This collateral serves as a potent force to discourage default.

Early savings associations dealt with default risk by requiring that loans be made in a local area where the owners and managers of the firm could have knowledge about the value of the property and about the character of the borrower. Today's managers rely on expert credit analysis and insurance to reduce default. Mortgage insurance is provided through the Federal Housing Authority (FHA) and Veterans Administration (VA) government programs to qualified savings association borrowers. For conventional mortgages, lenders often require that the borrowers take out private mortgage insurance (PMI) for highly leveraged properties—transactions whereby the purchaser borrows more than 80 percent of the property's value. For those less highly leveraged loans (less than 80 percent loan-to-value ratio), the lender usually bears the remaining risk directly. However, as long as the underlying property value does not collapse, the lender should be in a position to resell the property at a profit in case of default.

Interest rate risk is the threat that the interest rate will unexpectedly change so that the costs of a savings association's liabilities exceed the earnings on its assets. Savings associations were established to make long-term mortgages and fund them by taking in

short-term deposits. As long as the interest rate on the savings association's assets (loans) exceeds the interest rate on its liabilities (deposits), this spread, or gap, will yield positive earnings. If an intermediary pays his or her depositors 3 percent and then loans these funds out as 6 percent, the spread is a positive 3 percent. Problems occur when interest rates increase and the interest rates on short-term deposits increase more rapidly than those on long-term loans. The spread can quickly turn negative, thus creating losses, reducing capital, and, as we saw in the early 1980s, creating widespread insolvency in the industry. Imagine a situation in which an intermediary has to pay depositors 9 percent to attract deposits, but most of its assets are held as long-term mortgage loans paying only 6 percent. In this case, the intermediary faces a negative interest rate spread of 3 percent.

One way that savings associations manage interest rate risk is through the use of adjustable (variable) rate mortgages (ARMs), and mortgages fist introduced in Chapter 14. As the cost of funds rise or fall, the interest rates on these mortgage loans adjust upward or downward with the cost of funds. This adjustable rate helps savings associations maintain a positive interest rate spread between their loans and deposits even in the face of rising interest rates. It is worth noting that the risk has not been eliminated by ARMs. ARMs simply shift the interest rate risk from the lender to the borrower. If interest rates rise so that some borrowers are unable to make their payments, the savings association is exposed to a higher degree of default risk than it otherwise would have been with fixed-rate mortgages.

Savings associations have also reduced interest rate risk over time by holding fewer longer-term assets. As mentioned earlier, in the past twenty years savings associations have come to often resell mortgages soon after granting them. In addition, they have also come to use interest rate futures contracts and interest rate swaps in an attempt to reduce interest rate risk.

Savings associations also face liquidity risk—the threat that a savings association will be required to make a payment when it holds only long-term assets that cannot be quickly converted to cash without a capital loss. Savings associations rely on short-term liabilities (small savings and time deposits) to finance long-term assets (home mortgages). This makes them especially susceptible to liquidity problems when deposit withdrawals are greater than incoming deposits. To meet these withdrawal requests, savings associations can either sell some of their assets or take on more liabilities.

In terms of the asset side of the balance sheet, savings associations can sell mortgages, Treasury bills, or other assets to raise funds. On the liability side, the institution can borrow in the fed funds market, engage in repurchase agreements, or issue higher-interest-rate CDs to attract depositors. In case of severe liquidity problems, they may borrow at the discount window of their Federal Reserve district bank.

Recap Like all financial intermediaries, savings associations must deal with credit, interest rate, and liquidity risk. Default or credit risk is the probability of a debtor not paying the principal and/or interest due on an outstanding debt. It is managed by securing loans with collateral, using expert credit analysis, and requiring mortgage insurance. Interest rate risk is the threat that the interest rate will unexpectedly change so that the costs of a savings association's liabilities exceed the earnings on its assets. This can be managed through the use of adjustable rate mortgages and by selling mortgages into the secondary mortgage market. Liquidity risk is the threat that a savings association will be required to make a payment when it has only long-term assets than cannot be converted to liquid funds quickly without capital loss. Savings associations manage this risk by borrowing in the fed funds market, through the use of repurchase agreements, or through the discount window at the Fed. They can also sell mortgages, Treasury bills, or other assets.

The S&L Crisis of the Late 1980s

The high interest rates of the late 1970s created problems for the savings associations because they primarily funded long-term mortgage loans with short-term deposits. When interest rates rose, a positive spread could turn negative because the savings associations had to pay more for the use of deposits than they were earning on their assets. In addition, as we first saw in Chapter 5, as interest rates rose, the value of their long-term, fixed-rate mortgage assets fell. Thus, savings associations were exposed to a great deal of interest rate risk and had not yet developed the tools, such as adjustable rate loans and secondary markets, to manage that risk.

The problems for savings associations that began in the 1970s increased in the 1980s. Changes in regulations compounded the problems and a severe financial crisis developed. More than 1,500 institutions failed or went out of existence. Many others downsized and the industry as a whole shrunk considerably. Taxpayers spent billions of dollars to bail out the industry because the financial crisis threatened the health and stability of the entire economy. The result is an industry far different from what it was at the start of the 1980s. To understand today's S&L industry, we need to first understand the crisis it underwent in the 1970s and 1980s as well as the legislative attempts to ameliorate this crisis.

As in most crises, including the mortgage crisis after 2007, the seeds of the S&L debacle were planted long before the first sprouts of trouble appeared and can be found in the way S&Ls do business. Unless interest rates remain fairly stable for long periods of time, as they did from the early 1950s until the 1970s, it is risky to fund long-term loans or purchase long-term assets with short-term deposits. If interest rates rise, the cost of the funds borrowed over the short term can increase above what long-term assets are earning. As we saw earlier, S&Ls were literally established for the express purpose of borrowing short-term from passbook savers and lending long-term to finance mortgage loans. That is, they were designed to engage in behavior that would be dangerous in an environment of volatile or rising interest rates.

From the early 1950s on, the U.S. economy experienced a slow, upward drift in interest rates. Regulation Q, which put a ceiling on the interest rate that could be paid on deposits, applied to S&Ls as well as commercial banks. With Regulation Q in place, the cost of the funds borrowed, mostly from passbook savers, was maintained at or below the ceiling limits. Small savers, at least for a time, had few alternatives to passbook savings accounts in depository institutions. Consequently, disintermediation (the removal of funds from financial intermediaries) was relatively minor when interest rates on other financial assets such as Treasury bills or commercial paper went above the Regulation Q limits. The other financial assets were generally unavailable to small savers who did not have the minimum amounts required to purchase them (at the time $10,000 was the minimum amount needed to purchase a Treasury bill). By the 1970s, however, small savers did have money market mutual funds as an alternative to passbook accounts in depository institutions.[4] Still, the situation fermented for some time before the crisis occurred. By the late 1970s and early 1980s, events had begun to unfold that would result in total collapse of the industry and a large taxpayer bailout.

To understand the burgeoning crisis, recall that nominal interest rates are approximately equal to real interest rates plus the expected inflation rate. In the late 1970s, high nominal rates reflected expectations about inflation—that is, the high nominal rates were the result of large inflation premiums, not from high real interest rates. In fact, in the 1970s real rates were often abnormally low and sometimes even negative despite the high nominal rates. Negative real interest rates exist whenever the rate of inflation is higher than the nominal interest rate. This happened in the early 1970s when the rate of inflation was over 10 percent and the interest rate was below 10 percent.

In late 1979, the Fed orchestrated a huge spike in already high nominal rates as part of a policy aimed at reducing inflation. As the Fed reduced money supply growth, the funds available to lend declined and interest rates to both borrowers and lenders increased greatly. Interest rates on 30-year mortgage loans topped 18 percent, and interest rates offered to savers climbed far above the Regulation Q ceilings, which capped nominal rates while ignoring real rates. The spike in nominal rates caused severe disintermediation and/or the transfer of funds from S&Ls to money market mutual funds. In 1980, Congress passed the **Depository Institutions Deregulation and Monetary Control Act** (DIDMCA), which pertained to all depository institutions including savings associations. This act allowed S&Ls to issue checkable deposits in the form of negotiable orders of withdrawal (NOW) accounts and increased the asset and liability powers for thrifts. Additional legislation, the **Garn–St. Germain Act of 1982,** authorized S&Ls to offer **money market deposit accounts** (MMDAs) that competed with money market mutual funds. Money market deposit accounts actually had an advantage over money market mutual funds because they were insured by the FSLIC, whereas money market mutual funds were not. Garn–St. Germain slowed the disintermediation and the transfer of funds from the S&Ls to money market mutual funds, but it was probably too little too late. It also left the S&Ls with another problem: S&Ls had mostly long-term, fixed-rate assets, primarily low-rate mortgages, which were now funded by high-interest, variable-rate accounts. Thus, the S&Ls faced two related problems. First, their profits fell as their costs of funds increased faster than their earnings on assets. Second, the value of their assets fell. Recall that when interest rates rise, the value of long-term bonds falls. Long-term, fixed-rate mortgages are similar to long-term bonds in that when interest rates rise, the present value of long-term, fixed-rate mortgages goes down.

Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA)
The statute that removed many of the regulations enacted during the Great Depression, phased out Regulation Q, established uniform and universal reserve requirements, increased the assets and liabilities depository that institutions could hold, authorized NOW accounts, and suspended usury ceilings.

Garn–St. Germain Act of 1982
A statute that, along with the DIDMCA, deregulated the financial structure, and authorized money market deposit accounts and Super NOW accounts.

Money Market Deposit Accounts (MMDAs)
Financial claims with limited check-writing privileges, offered by banks since 1982; they earn higher interest than fully checkable deposits and require a higher minimum balance.

In 1981, long before the crisis came to a head, economists had estimated that the S&L industry had a substantial negative net worth that was far greater than the assets of the FSLIC, which insured the deposits of the sickly S&Ls.[5] Rather than confronting the problem head-on in the early 1980s, which would have required injecting taxpayer funds into the system, Congress responded with actions that would eventually make the situation much worse. As noted previously, the legislation of 1982 expanded the lending powers of the S&Ls. S&Ls were allowed to enter new product lines that paid a high return but were unfamiliar to S&L managers and entailed considerable risk. Capital requirements—the cushion against losses—were also lowered so that the S&Ls could aggressively enter the new lending arenas. Rather than having to hold capital equivalent to 5 percent of assets, S&Ls were required to hold capital equal to only 3 percent of assets.

With expanded lending powers and lower capital requirements, the industry made new high-earning investments in such ventures as junk bonds and commercial real estate. What happened next? Many S&Ls ended up losing even more and literally went broke. In late 1986, Congress granted the FSLIC $10.8 billion funded by borrowing against future deposit insurance premiums to be paid by the thrifts themselves. In 1988, the Federal Home Loan Bank, the equivalent of the Fed for S&Ls at the time, liquidated more than 200 insolvent thrifts by selling the institutions to individuals and firms. In the liquidation process, the buyers were compensated for the negative net worth of the institutions with an array of future guarantees and obligations, including tax breaks. None of these compensations required congressional authorization or appropriation, and they have subsequently been viewed with suspicion.

In 1989, Congress responded with the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA), which attempted to resolve the problems of widespread failures within the industry and insufficient insurance funds to settle the crisis. Besides providing funds to resolve the S&L crisis, the most important changes of this act were the elimination of the FHLBB system and the FSLIC as the savings association insurer. In

Looking Back

The Lincoln Savings Scandal

Lincoln Savings was a pristine S&L in the idyllic planned community of Irvine, California. It was purchased for $51 million in 1984 by American Continental of Phoenix, a large real estate development company controlled by Charles Keating. In hindsight, it is surprising that Keating was allowed to buy Lincoln, since he had been accused of fraud by the Securities and Exchange Commission only four years earlier. As a state-chartered institution, Lincoln was permitted unlimited direct investment in real estate, a potential gold mine for a real estate developer. Within days of taking the helm, Keating fired moderate loan officers and rushed into high-risk investments including junk bonds, desert land in Arizona, hotels, common stock, currency futures, and real estate developments, including those of his own American Continental.

The Federal Home Loan Bank Board (FHLBB) was responsible for regulating and insuring Lincoln Savings. Although under the state charter Lincoln was free to make unlimited direct investments in real estate, the FHLBB balked and announced a regulation that limited direct investment in real estate to 10 percent of total assets for S&Ls insured with the FSLIC. In 1986, regulators from the Federal Home Loan Bank in San Francisco realized that Lincoln had exceeded this limit for federally insured thrifts by some $600 million. By 1987, the regulators realized that Lincoln Savings was in serious trouble, and they wanted to move in and seize the institution.

Keating responded by seeking the help of influential politicians. He made large political contributions, in particular giving $1.3 million to five U.S. senators who became known as the "Keating Five."[a] These senators intervened with the FHLBB on behalf of Lincoln and met with Edwin Gray, chair of the FHLBB, and top regulators from the San Francisco office. The senators alleged that the regulators were being too hard on Lincoln and asked for regulatory leniency.

In September 1987, M. Danny Wall replaced Edwin Gray as chair of the FHLBB. He later continued on at the Office of Thrift Supervision (OTS). Wall transferred the regulation of Lincoln from the San Francisco office to the Washington office, a most unconventional move. No regulator walked into Lincoln for the next 10 months. In early 1987, Lincoln had assets of $3.9 billion. By early 1989, when Lincoln failed, its assets had grown to $5.5 billion. Obviously, a lot of lending had been done. The Lincoln failure ended up costing taxpayers about $2.5 billion. M. Danny Wall was forced to resign because of his involvement in the scandal, and both Charles Keating and his son were sentenced to prison on numerous convictions for negligence and fraudulent acts.[b]

Of the many fraudulent practices that Lincoln engaged in, perhaps the most pernicious was misrepresentation in the sale of subordinated debt. Subordinated debt is unsecured debt that in the event of default will not be repaid until other creditors are repaid. Buyers of this debt, who later swore to investigators they had been guaranteed that the debt was insured just like other deposits in an S&L, lost about $200 million. Many of these unsuspecting investors were senior citizens who lost their life savings.

Endnotes

a. The senators were Dennis DeConcini and John McCain of Arizona, Alan Cranston of California, John Glenn of Ohio, and Donald Riegle of Michigan. Check the reelection results for these senators after the scandal, and you may be surprised at what you find.
b. After serving almost five years in prison, Keating was released in December 1996, when his convictions were thrown out on technicalities. A a chronologically organized list of bibliographic resources on the S&L crisis can be found at **www.fdic.gov/bank/historical/s&l1/index.html.**

their place, the Office of Thrift Supervision now serves as the primary federal regulatory agency for the industry. FSLIC's responsibilities were folded into the FDIC and its newly created **Savings Association Insurance Fund** (SAIF). The act also created the **Resolution Trust Corporation** (RTC) as a temporary agency to dispose of thrift properties that failed between 1989 and 1995. The FDIC was put in charge of overseeing the RTC. The provisions of the DIDMCA, Garn–St. Germain Act, and FIRREA are covered in more detail in the next chapter.

Savings Association Insurance Fund (SAIF)
An organization created by FIRREA in 1989 and managed by the FDIC to provide insurance for savings association deposits. It replaced the defunct FSLIC.

Resolution Trust Corporation (RTC)
An agency created by the FIRREA in 1989 to dispose of the properties of failed S&Ls.

The financial bailout shifted the costs from the owners of S&Ls and their depositors to the public (taxpayers) at large.[6] According to Timothy Curry and Lynn Shibut in the *FDIC Banking Review*,[7] the total cost of the cleanup was approximately $153 billion. About $124 billion was paid by taxpayers and the other $29 million was paid for by savings associations. This estimate is significantly higher than initial estimates in the late 1980s and substantially lower than estimates of a half a trillion dollars put forward in the mid-1990s.

What can we conclude about the causes of the S&L crisis? Undoubtedly, the inherent problem of lending long and borrowing short when interest rates were rising was a major factor. Another factor was the extension of lending powers to the thrifts in the early 1980s. These new powers, which allowed for more risk taking, also seem to have attracted some dishonest folk to the industry. Finally, regulators were slow to move in and shut down troubled thrifts, which caused eventual losses to be greater than they otherwise might have been, and Congress was also slow to act. Fraud also played a supporting role in the crisis, as described in the accompanying "Looking Back" feature on the Lincoln Savings scandal. Many hard lessons were learned as taxpayer funds were diverted to bail out the S&L industry rather than being used to build schools, improve our nation's infrastructure, or for any other worthwhile projects.

Recap

The S&L crisis resulted primarily because the structure of lending long and borrowing short was seriously disrupted by volatile and high interest rates of the late 1970s and early 1980s. The Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) of 1989 served as the S&L bailout bill. It created the Office of Thrift Supervision (OTS) to oversee the savings association industry, moved FSLIC's responsibilities to the FDIC's Savings Association Insurance Fund (SAIF), and created the Resolution Trust Corporation (RTC) to manage the liquidation of assets from failed S&Ls.

CREDIT UNIONS

History and Regulation

Credit unions, the third type of thrift organization, are cooperative, nonprofit, member-owned, tax-exempt depository institutions operated for the benefit of the member savers

and borrowers who share a common bond. Credit unions are frequently managed by boards of directors and supervisory committees composed entirely of volunteers who wield substantial decision-making power over the institution. Unlike savings associations, which specialize in the provision of long-term housing credit, credit unions specialize in small, short-term consumer loans. Also unlike a savings association, the general public cannot "join"—deposit into or borrow from—a particular credit union. By law, members must share a common bond such as an employer, a church, a labor union, or a geographic region. As of 2008, the Credit Union National Association (CUNA) reported that over 85 million Americans, many of them federal government, state government, and public utilities employees, were members of the 8,362 credit unions in operation. Among the 20 largest federally insured credit unions in the United States are the Navy, the North Carolina State Employees, the Pentagon, the Orange County Teachers, and the Boeing employees' credit unions.

The history of credit unions is similar to that of savings institutions—they arose out of frustration with the lack of attention commercial banks gave to the saving and credit needs of ordinary working people. Although savings institutions were created to help address these needs with respect to mortgage credit, the need for small loans to buy automobiles and furniture, or for home improvements and other personal expenses, remained unmet. The credit union filled this niche.

The first credit unions began in Germany in the 1840s. They spread to Quebec in 1900 and finally to the United States in 1909 with the establishment of St. Mary's Cooperative Credit Association in Manchester, New Hampshire. In 1914, the Massachusetts Credit Union (MCU) was organized both to serve as a regular credit union and to assist with the creation of new credit unions. Over time it evolved into a kind of central credit union and trade association for the industry. In 1921, the MCU became the **Credit Union National Extension Board** (CUNEB), whose primary purpose was to expand the credit union movement across the country. In 1935, it was reorganized again to become the **Credit Union National Association** (CUNA).

Credit Union National Extension Board (CUNEB)
A privately created organization formed in 1921 to expand the credit union movement across the country; a forerunner to the CUNA.

Today, CUNA serves as the "premier national trade association" in the country for credit unions. CUNA works in partnership with state credit union leagues to assist credit unions with legislative and regulatory advocacy, professional education, and market research. CUNA also works with other organizations to provide quality products and services to credit unions more cheaply than individual institutions could acquire on their own.

Credit Union National Association (CUNA)
The largest credit union trade association in the United States, it provides bulk purchases of supplies, automated payment services, credit card programs, and various investment options to member credit unions.

The federal government also had a hand in facilitating credit union growth. On June 26, 1934, the Federal Credit Union Act was signed into law by President Franklin D. Roosevelt "to establish the Federal Credit Union System, to establish a further market for securities of the United States, and to make more available to people of small means credit for provident purposes through a national system of cooperative credit, thereby helping to stabilize the credit structure of the United States." In the debate over the act, neither the Federal Reserve Board nor the Comptroller of the Currency (OCC) wanted regulatory responsibility over federal credit unions. The Farm Credit Administration took initial responsibility, and over the years responsibility shifted to bureaus within the FDIC, the Federal Security Agency, and the Department of Health, Education and Welfare.

National Credit Union Association (NCUA)
A federal regulatory agency created in 1970 to charter and regulate federally chartered credit unions and state member institutions.

Credit union membership and assets continued to grow steadily in the post–World War II period as did the need for stronger federal regulatory oversight. To meet this need, the National Credit Union Act of 1970 established the **National Credit Union Association** (NCUA) as an independent federal agency to charter and regulate federally chartered credit unions and state member institutions.[8] The act also created

National Credit Union Share Insurance Fund (NCUSIF)
A federal agency created in 1970 to insure the deposits of federally chartered credit unions and state member institutions.

the **National Credit Union Share Insurance Fund** (NCUSIF)—which is managed by the NCUA board—to "insure" credit union deposits. All federally chartered credit unions are required to join the NCUSIF system. State-chartered credit unions that qualify for and choose to become members of NCUSIF may also join. As with commercial banks and savings associations, depositors at insured credit unions are covered up to a maximum of $250,000 as of 2009. Some state-chartered credit unions continue to be insured by their state depository agency.[9] Unlike a bank or savings association that pays an explicit premium for deposit insurance, credit union insurance is more like a mutually owned investment pool—credit unions set aside 1 percent of their deposits in the NCUSIF.[10] If credit unions fail, they dip into the fund to pay off their depositors. When necessary, the NCUA board can charge an additional premium. Fortunately, this has not been necessary since the early 1990s. Congress has also mandated that when the insurance fund holds more than 1.3 percent of total credit union insured deposits, these additional funds must be returned to credit unions as dividends on their investments.

The common bond requirement and limited geographic diversification of credit unions leave them especially vulnerable to short-term liquidity problems. If a credit union has short-term liquidity needs, it can borrow from other credit unions or from a network of (corporate) state central credit unions. Since 1974, these corporate central credit unions (300 in 2004) have worked in conjunction with the **U.S. Central Credit Union** (the credit union equivalent of a central bank) to provide their member credit unions with electronic settlement services and access to national and international money and capital markets.

U.S. Central Credit Union
The central bank for credit unions.

Central Liquidity Facility (CLF)
A lender of last resort created in 1978 for credit unions experiencing temporary liquidity problems.

In addition to this network of state credit unions, the **Central Liquidity Facility** (CLF) was created in 1978 to serve as a "lender of last resort" for credit unions. To use this facility, credit unions must become members and prove that they need the liquidity. This is similar to the way in which the Fed's discount window serves commercial banks. Temporary emergency loans are commonly used to boost the liquidity of troubled credit unions or to meet their short-term seasonal funding needs. For most day-to-day liquidity needs, state central credit unions are sufficient. However, in case of a nationwide crisis, the CLF can borrow directly from the Federal Reserve and thus provide liquidity to credit unions across the country. Membership in the CLF is voluntary.

16-3
Distribution of Insured Credit Unions by Asset Size, End of 2008

	Numbers of Institutions		Assets (in billions of dollars)	
	Number	Percent	Number	Percent
Total	7,806	100.0	$813.4	100.0
Under $10 million	3,274	41.9	$12.3	1.5
$10 million to $100 million	3,248	41.6	$112.53	13.8
$100 million to $500 million	954	12.2	$205.93	25.4
Over $500 million	329	4.3	$482.61	59.3

Source: National Credit Union Administration Year-End Statistics, 2008.
www.ncua.gov/DataServices/

Distribution of Credit Unions

Although there are about as many credit unions as there are commercial banks and savings associations combined, most are small in size. At year-end 2008, the total assets of credit unions stood at about $813 billion compared to the roughly $1.4 trillion controlled by savings associations and $10.09 trillion for commercial banks. Exhibit 16–3 shows that most credit unions (83.5 percent) have total assets of less than $100 million. The largest credit unions—those with $500 million or more in assets—constitute 4.3 percent of credit unions and control 59.3 percent of credit union assets. Thus, like the savings associations and commercial banks, a few larger credit unions control the majority of the industry's assets. In comparison to savings associations, the typical credit union is likely to possess less than $100 million in assets. The typical (median) savings association has an asset size between $100 million and $500 million, making the typical savings association at least 10 times larger than the typical credit union.

Recent Trends

From 1950 until 1970 the number of credit unions increased dramatically, reaching a peak of over 23,000. By the year 2000 there were fewer than 11,000 credit unions left. Exhibit 16-4 shows this trend has continued in recent years, with the number falling from 9,209 to 8,208 from 2004 to 2008. Since 1975, nearly two-thirds of U.S. credit unions have closed, changed their charter, or merged with other institutions.

Credit unions are mutual institutions because they are owned by their depositors. This affects how we talk about credit union deposits and returns. Member deposits are called shares. Like the earnings from stock ownership, the interest paid on these deposits is called dividends. Currently credit unions receive the vast majority of their funds from members' small time/savings accounts, called regular **share accounts. Share draft accounts** are interest-bearing checking accounts that were developed in the early 1970s and made available nationally in the 1980s by changes in federal regulation. Credit unions also offer **share certificates,** which are similar to the CDs offered by other depository institutions. The depositor agrees to leave the funds for a specified length of time and is rewarded with a higher interest rate.

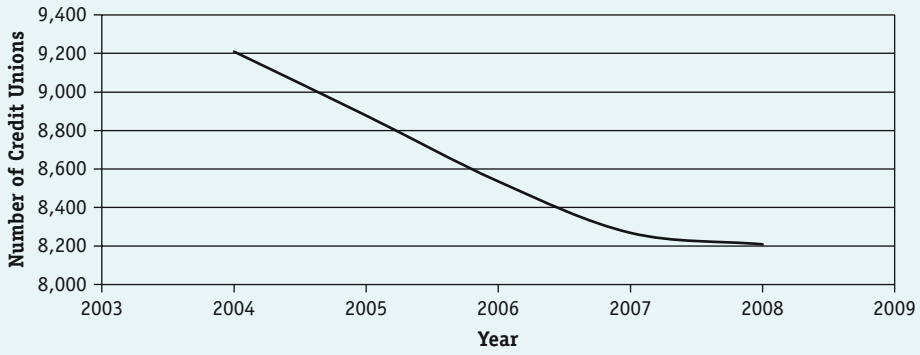
Share Accounts
Highly liquid credit union accounts that allow withdrawals on demand, but not by writing a check.

Share Draft Accounts
Interest-bearing checking accounts of credit unions.

Share Certificates
The credit union equivalent of a CD.

Not every credit union offers every financial product. According to the Credit Union National Association (CUNA) Credit Union Profile for the first quarter of 2008, 72.6 percent offered share draft (personal checking) accounts, 50.6 percent offered credit

16-4
Number of U.S. Credit Unions



Source: Credit Union Profile, CUNA Economics and Statistics, June 2008. http://advice.cuna.org/download/uscu_profile_2q09.pdf

Credit Unions, Corporate Taxes, and the Community Reinvestment Act

Should credit unions be exempt from corporate taxes and the Community Reinvestment Act (CRA)?[a] These questions are at the center of a debate between commercial banks and credit unions. Commercial banks, even small community banks, are subject to corporate taxes as well as CRA requirements. Many bankers believe that credit unions behave similarly to banks—they lend money and take deposits. However, due to the nonprofit status of credit unions, they are tax exempt. Some bankers believe that this leads to an unfair advantage. Because of their tax exemption, credit unions are allowed to pay higher interest rates and charge lower fees to their members.

Bankers also believe that credit unions have another advantage in the area of community reinvestment. Since banks must comply with the CRA in order to merge with other banks, many pay millions each year to provide services to low-income areas. Bankers charge that credit unions should be required to comply because many are failing when it comes to investment in low-income areas.

Credit unions, of course, have a response to the claims made by banks. Credit union officials believe that banks want increased control over the financial services industry, and that by forcing credit unions to pay taxes and comply with the CRA, banks will succeed in reducing price competition from credit unions. Because some credit unions are small, community-based entities, forcing them to pay corporate taxes could threaten their solvency. Credit unions would also have to increase their fees and lower the interest rates paid to their members in order to have the extra revenue needed to pay taxes.

Credit union officials also disagree with bankers about the CRA. Community-based credit unions serve the people within their designated communities, thus making loans to low-income members without the coercion of federal regulation. Credit unions argue that, contrary to the assertions of many bankers, they do serve low-income individuals who would not otherwise be able to receive loans or other financial services. Resolution of this debate will likely be left to the courts, with the loser appealing to Congress.[b]

Endnote

a. The Community Reinvestment Act is a body or regulation which requires banks to actively serve disadvantaged areas and correct alleged discriminatory practices. We will cover this in more detail in Chapter 17 which directly concerns regulation.

b. For more on this topic, see Kelly Culp, "Banks v. Credit Unions: The Turf Struggle for Consumers," *Business Lawyer* 53, no. 1 (November 1997): pp. 193–216.

cards, 56 percent offered home loans, and 95 percent offered auto loans. Most credit union members hold accounts at credit unions that offer seven of the following eight services: share drafts, certificates, ATM cards, guaranteed student loans, first mortgages, direct deposit of federal recurring payments, credit cards, and travelers' checks.

We turn now to credit union uses of funds. As of mid-2008, about 29 percent of the assets held by credit unions were in the form of consumer loans to members for automobiles, furniture, appliances, boats, and other personal needs (compared to 39 percent in 2000). Forty percent of assets were in the form of home mortgages (compared to 27.4 percent in 2000), and 10.5 percent of the assets held were U.S. Treasury and government agency securities, including debt issued by Freddie Mac and Fannie Mae (compared to 15.2 percent in 2000). The remaining assets were deposits at other financial intermediaries, fed funds, repurchase agreements, and miscellaneous items.

Total funds acquired and loaned by credit unions have grown rapidly over the years. In 1970, for example, their assets totaled only $18 billion. This grew to $475 billion in 2000, and to $794 billion by 2008. Nevertheless, credit union assets remain less than half that of savings association assets and one-fourteenth of commercial bank assets.

Recap Credit unions are cooperative, nonprofit, member-owned, tax-exempt depository institutions operated for the benefit of the member savers and borrowers who share a common bond. They are regulated at the federal level by the National Credit Union Association (NCUA) and insured by the National Credit Union Share Insurance Fund (NCUSIF). The majority of credit unions (83.5 percent) have assets of less than $100 million. The largest 4.3 percent of credit unions control 59.3 percent of credit union assets. The number of credit unions peaked in the 1970s. Since then, mergers have reduced their numbers. Despite the recent consolidation in numbers of credit unions, membership and total assets have continued to increase. The main sources of funds for credit unions are savings/small time deposits and share draft accounts. These funds are used primarily to make small personal and mortgage loans and to purchase government securities.

Credit Union Management of Risk

Because of their common bond requirement and balance sheet structure, credit unions face different degrees of default, interest rate, and liquidity risk, as do other financial intermediaries. Like savings associations, they generally do not experience significant exchange rate risk. Credit unions are exposed to default risk primarily through the loans they make to their members. Most of these loans are secured by real property in the case of mortgages, or by titles to automobiles or boats for other types of loans. This holding of collateral reduces risk. Like their savings association peers, credit unions also require various forms of mortgage insurance and engage in expert analysis to lessen default risk.

One concern is that credit unions often rely on volunteers to assist potential borrowers. These volunteers may lack the necessary training and/or emotional distance from the borrower to engage in effective analysis. A second concern is that the common bond requirement of credit unions makes them vulnerable to a downturn in the local economy. Credit unions are designed to meet local needs and, in some cases, the needs of employees of a single company. If that company experiences a decrease in sales and responds by laying off workers or, in the worst case, shuts down its local facility, the credit union catering to these workers will face sharply higher rates of default. These risks, of course, would be worsened by weak local economic conditions.

Like savings associations, credit unions fund long-term assets with short-term liabilities. However, they tend to hold a smaller proportion of their assets in mortgages

and the personal loans they grant tend to be for shorter periods of time. As of 2008, savings associations and credit unions hold roughly 60 percent and 40 percent, respectively, of their assets as mortgages. Thus, savings associations have a larger degree of interest rate risk than do credit unions. For the mortgages that credit unions do offer, the use of variable-rate mortgages and the sale of mortgages to the secondary market help limit exposure to interest rate risk.

In the case of unanticipated deposit withdrawals, credit unions face the need to raise cash quickly. To meet these withdrawal requests, credit unions can turn to the Central Liquidity Facility. Unlike their banking and savings association counterparts, they are less able to bring in funds through higher CD rates because their common bond requirement severely limits the number of new customers available. The desire to reduce exposure to liquidity risk through credit union mergers has been one of the driving forces for consolidation among credit unions today.

Recap

Like all financial intermediaries, credit unions must deal with credit, interest rate, and liquidity risk. Default risk is handled in a way similar to that of savings associations: collateral is held, mortgage insurance is required, and expert credit analysis is utilized. Interest rate risk is less of an issue for credit unions than for savings associations because of the shorter-term assets held by credit unions. Nevertheless, adjustable rate mortgages and use of the secondary mortgage market can assist credit unions in maintaining a positive interest rate spread. Liquidity risk or an illiquid financial position can be dealt with by accessing funds through the Central Liquidity Facility (CLF). Recent mergers among credit unions have, in part, been motivated by a desire to broaden the liability base of credit unions and thereby reduce liquidity risk.

The Evolution of Thrifts

Savings banks, savings and loans associations, and credit unions share a common theme in their birth and subsequent evolution. All were created out of a need for ordinary people to have access to convenient and affordable savings and lending services. However, these institutions today bear little resemblance to their institutional ancestors. As economic conditions (especially high and volatile interest rates) and telecommunications technology have changed, so have the risks facing these intermediaries. Thrifts have responded by creating new saving and lending instruments, expanding the range of services provided, widening the geographic areas over which they do business, and competing more directly with other types of financial intermediaries. Since the creation of thrifts, Congress and federal regulatory agencies have assisted their development with the creation of deposit insurance, various forms of federal regulatory oversight, as well as various attempts at deregulation and reregulation. The interplay among these changes in economic conditions, technology, regulation, and risks continues to bring about the financial innovation we have described in this chapter. In the next chapter, we take a closer look at how commercial banks, savings associations, credit unions, and other financial services firms are regulated.

In recent decades the increasing importance of securitization, specifically mortgage-backed securities, seemed to run counter to the historical practice of making loans and then holding them as assets, collecting the payments over long periods of time. This lending model, upon which savings associations and thrifts were based, seems likely to make a comeback as a result of recent problems in mortgage markets. Perhaps coming decades will see a relative resurgence in the relationship-based finance that these institutions have specialized in.

Summary of Major Points

1. Thrift institutions consist of savings associations (savings banks and S&Ls) and credit unions. All were created in part because of the failure of commercial banks to fulfill the savings, housing finance, and consumer credit needs of working-class individuals.
2. State chartering of savings banks began in 1816 and federal chartering in 1978. Chartering of savings and loan associations (S&Ls) began at the state level in 1831 and at the federal level in 1934. At the federal level, the Federal Home Loan Bank Board (FHLBB) served as the primary regulatory agency for both types of savings associations until 1989; it was then replaced by the Office of Thrift Supervision (OTS). The Federal Savings and Loan Insurance Corporation (FSLIC) insured savings associations until 1989, when its functions were assumed by the Federal Deposit Insurance Corporation's (FDIC's) Savings Association Insurance Fund (SAIF).
3. Savings banks can be either mutual savings banks or stock savings banks. Mutuals do not issue capital stock but instead are owned and controlled by their depositors and, in some cases, their borrowers. Member owners do not usually share in the profits of the firm, but often elect the governing board of the institution. Stock savings banks do issue stock and are controlled by their shareholders.
4. Early savings and loan associations functioned more like temporary mutual funds with limited membership than like the S&Ls of today. Over time, they began to operate on a perpetual basis and to regularly accept new members.
5. The similarities between S&Ls and savings banks are much greater than their differences. The central mission of both types of institutions is to encourage thrift and to fund home purchases. The major sources of funds for savings associations are time, savings, and checkable deposits. Their major uses of funds are for mortgage loans and U.S. government securities.
6. Most savings associations have assets of less than $1 billion. However, the largest 13.8 percent of savings institutions control more than over 80 percent of all savings association assets. From 1984 to mid 2009, the number of savings associations has fallen in half—from 3,418 to 1,200—while the average size of savings associations has more than doubled.
7. Like all financial intermediaries, savings associations must deal with credit, interest rate, and liquidity risk. (Exchange rate risk typically plays a minor role for savings associations and credit unions.) Default or credit risk is managed by securing loans with collateral, using expert credit analysis, and requiring mortgage insurance. Interest rate risk is managed through the prudent use of adjustable rate mortgages and by selling mortgages into the secondary mortgage market. Savings associations manage liquidity risk by borrowing in the fed funds market, through the use of repurchase agreements, or through the discount window at the Fed. They also sell mortgages, treasury bills, or other assets.
8. The S&L crisis of the late 1980s came about primarily because S&Ls were created to make long-term loans that were funded by borrowing in the short term. This balance sheet structure was seriously disrupted by the volatile, high interest rates of the late 1970s and early 1980s. The Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) of 1989 served as the S&L bailout bill. It created the Office of Thrift Supervision to oversee the savings association industry, moved FSLIC's responsibilities to the FDIC's Savings Association Insurance Fund, and created the Resolution Trust Corporation (RTC) to manage the liquidation of assets from failed S&Ls.
9. Credit unions are cooperative, nonprofit, member-owned, tax-exempt depository institutions operated for the benefit of the member savers and borrowers who share a common bond. They are regulated at the federal level by the National Credit Union Association (NCUA) and insured by the National Credit Union Share Insurance Fund (NCUSIF). Many are members of the Credit Union National Association (CUNA), which serves as a trade association for the industry. The Central Liquidity Facility (CLF) serves as a lender of last resort for credit unions with temporary liquidity problems.
10. The majority of credit unions (83.5 percent) have assets of less than $100 million. The largest 4.3

percent of credit unions control 59.3 percent of credit unions assets. The number of credit unions peaked in the 1970s. Since then mergers have reduced their numbers. Despite the recent consolidation in numbers of credit unions, membership and total assets have continued to increase. Their main sources of funds for credit unions are savings/small time deposits and share draft accounts. These funds are primarily used to make small personal loans, mortgage loans, and to purchase government securities.

11. Credit unions manage default risk by holding collateral, requiring mortgage insurance, and utilizing expert credit analysis. Adjustable rate mortgages and use of the secondary mortgage market assist credit unions in managing interest rate risk. An illiquid financial position can be dealt with by accessing funds through the Central Liquidity Facility (CLF), selling assets, or increasing one's liabilities.
12. The traditional business models of thrifts, making loans and then holding them as assets, seemed to be declining in importance, at least until the last few years. Until 2007, the dominant model for the future appeared to be based on making loans, packaging them, and reselling them as asset-backed securities. Recent difficulties in the mortgage market and with the government-sponsored entities Freddie Mac and Fanny Mae may signal a resurgence of the more traditional model whereby lenders hold mortgages they make as assets on their balance sheet.

Key Terms

Central Liquidity Facility (CLF), p. **393**
Credit Union National Association (CUNA), p. **392**
Credit Union National Extension Board (CUNEB), p. **392**
Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA), p. **389**
Federal Home Loan Bank Board, p. **381**
Federal Savings and Loan Insurance Corporation (FSLIC), p. **381**
Garn–St. Germain Act of 1982, p. **389**
Money Market Deposit Accounts, p. **389**
Mortgage, p. **XX**
Mutual Savings Bank, p. **382**
National Credit Union Association (NCUA), p. **392**
National Credit Union Share Insurance Fund (NCUSIF), p. **393**
Office of Thrift Supervision (OTS), p. **383**
Resolution Trust Corporation (RTC), p. **391**
Savings Association Insurance Fund (SAIF), p. **391**
Share Accounts, p. **394**
Share Certificates, p. **394**
Share Draft Accounts, p. **394**
Stock Savings Bank, p. **382**
U.S. Central Credit Union, p. **393**

Review Questions

1. Briefly discuss the primary motivations for the creation of savings banks and savings and loan associations in the early nineteenth century.
2. What are the two possible forms of ownership for savings banks and how do they differ?
3. Savings and loan associations have significantly changed the way in which they finance mortgages. Compare the process in 1831 to the process used in the early twenty-first century.
4. List and explain the similarities and differences between savings and loans and savings banks.
5. Describe the size distribution of savings associations. What size category is the most numerous? What size category controls the greatest share of assets?
6. How has the number of savings associations changed since 1984?
7. Before being phased out in 1980, why were Regulation Q ceilings set one-half percent higher for savings associations than for banks?
8. List and describe the major sources and uses of funds for savings associations. How have these changed since the early 1980s?

9. List and explain the major ways in which savings associations manage default risk, interest rate risk, and liquidity risk.
10. Have adjustable rate mortgages eliminated interest rate risk? Explain.
11. Who is Charles Keating and why did he go to jail?
12. Describe the functions of the following credit union agencies:
    a. CUNEB
    b. CUNA
    c. NCUA
    d. NCUSIF
    e. U.S. Central Credit Union
    f. CLF
13. Describe the size distribution of credit unions. What size category is the most numerous? What size category controls the greatest share of assets? How does the size of a typical credit union compare to the size of a typical savings association?
14. How has the number of credit unions changed since 1950?
15. Give the name of the credit union equivalent of the following savings association deposit liabilities:
    a. Passbook savings account
    b. NOW or MMDA account
    c. Certificate of Deposit
16. List and describe the major sources and uses of funds for credit unions.
17. List and explain the major ways in which credit unions manage default risk, interest rate risk, and liquidity risk.

Analytical Questions

18. Explain why credit unions and pension funds rarely purchase municipal securities while casualty companies do. (Hint: It has something to do with the tax status of credit unions.)
19. How has savings association management of credit risk changed over time?
20. Imagine that you are the manager of an S&L. Deposit withdrawals have been $3 million more than anticipated during the morning hours. There is little vault cash remaining and it is four hours until closing time. What options do you have to address this liquidity problem?
21. Write one paragraph that accurately identifies and describes the primary causes of the S&L crisis of the 1980s. In a second paragraph, list and explain the actions and effects of the regulatory acts passed in 1980, 1982, and 1989 that attempted to address the S&L crisis.
22. How might a decline in the importance of mortgage-backed securities affect the relative importance of savings and loans and credit unions as providers of home loans?

Suggested Readings

In recent years, most researchers and textbook writers no longer examine or discuss the savings and loan crisis of the late 1980s in any detail. This is unfortunate, since the current mortgage market crisis is similar in some important respects. These similarities are addressed in two working papers published by the Levy Economics Institute in 2008. In "Changes in the U.S. Financial System and the Subprime Crisis," Jan Kregel traces the evolution of housing finance from deregulation in the 1970s, to the savings and loan bailout in the 1980s, and finally the current mortgage market crisis. In "Old Wine in a New Bottle: Subprime Mortgage Crisis—Causes and Consequences," Michael Lim explains how excessive leveraging and financial risk mismatching were at the heart of both the S&L troubles of the 1980s as well as the current crisis. Both are available from the Levy Economics Institution Web site at: **www.levy.org/vtype.aspx?doctype=13.**

The early history of the credit union movement both in Germany and the United States is summarized by J. Carroll Moody in *The Credit Union Movement: Origins and Developments, 1850–1970* (Lincoln: University of Nebraska Press, 1971). Despite the unique historical role played by credit unions, they have continued to evolve over time. As a result, some credit unions are now quite similar to their more heavily regulated and corporate-taxed commercial bank competitors. The result has been a heated debate about whether credit unions should be forced to comply with the

Community Reinvestment Act (CRA) and/or allowed to maintain their tax-exempt status. George Cleland argues that they should not be allowed to maintain their status in "Bank-like Credit Unions Should Face Bank-like Taxes," *ABA Banking Journal* 81, no. 1 (January 1989): p. 14. In contrast, Ken Robinson in an *American Banker* article entitled "Compromise by Banks Is Bait-and-Switch Tactic" (vol. 163, no. 49, March 13, 1998, p. 4) discusses the recent banking lobby proposal that separates credit unions into various categories and then imposes category-specific restrictions on these credit unions. Finally, Kelly Culp outlines the many legal battles between banks and credit unions in her "Banks v. Credit Unions: The Turf Struggle for Consumers," *Business Lawyer* 53, no. 1 (November 1997): pp. 193–216.

The S&L crisis has served as a magnet for a large number of scholars assessing its causes and consequences. Right-leaning authors tend to see deposit insurance and the moral hazard problems it created as a primary cause of the problem. For an eloquent and thoughtful discussion on this topic, see Edward J. Kane's *The S&L Insurance Mess: How Did It Happen?* (Washington DC: Urban Institute Press, 1989). Kane argues that the undercapitalization of S&Ls, combined with the flat-rate deposit insurance premiums charged, caused the large number of failures and high resolution costs. Regulatory reluctance and legislative lethargy further exacerbated the crisis. He suggests that the crisis could have been lessened with better accounting practices and more reliable reporting procedures. In his 1991 book, *The Great Savings and Loan Debacle*, James R. Barth concurs with Kane that deposit insurance plays a central role. However, Barth also provides an historical approach to understanding S&Ls while proffering the need for higher capital standards and the more free-market-oriented remedies of geographic deregulation and an expanding macroeconomy. In contrast to Kane and Barth, left-leaning Lawrence J. White argues in his book, *The S&L Debacle: Public Policy Lessons for Bank and Thrift Regulation* (New York: Oxford University Press, 1991), that deposit insurance is not the root cause. Instead, he posits that inadequate regulation and insufficient capital requirements bear the primary burden for the crisis. He strongly opposes remedies that would weaken the deposit insurance system. For a lighter approach to understanding the debacle, try Martin Mayer's *Greatest-Ever Bank Robbery: The Collapse of the Savings and Loan Industry* (New York: Charles Scribner's Sons, 1990). Mayer describes a rich cast of mostly Wall Street investment bankers, accountants, regulators, and lawyers who helped cause and directly profited from the crisis. He also cautions against the current move away from the specialized housing finance institutions that are founded on using local funds to meet local housing needs. The quote from Charles Keating that opens this chapter is recounted by William G. Kastin, Esq., during a hearing on campaign spending and the first amendment. It can be found at **www.fordham.edu/law/pubs/iplj/html/article.html.** Finally, for a romantic portrayal of savings and loan associations during the 1930s and the bank runs they faced, it is hard to beat the Christmas classic, *It's a Wonderful Life*, staring Jimmy Stewart. The relevant scene is currently available on YouTube: **www.youtube.com/watch?v=MJJN9qwhkkE).**

Reading from this list should help you to earn your wings.

Endnotes

1. To be pre-qualified for a loan means that you have met with a banker to discuss your current assets and debts and have estimated how much house you can afford. In contrast, to be pre-approved for a loan means that you have actually completed a loan application for a particular loan amount and had the lender examine your credit report.
2. According to the Office of Thrift Supervision, the thrift industry is defined as: "All of the operating financial institutions that primarily accept deposits from individual savers and loan funds primarily for home mortgages. These include savings and loan associations and savings banks." Throughout this text we also include credit unions in our definition of thrifts. We justify this by pointing out that savings associations and credit unions are primarily concerned with the provision of saving and lending to individuals and households. In contrast, commercial banks tend to be more concerned with the saving and borrowing needs of business enterprises.
3. In his *History of Money: From Ancient Times to the Present Day* (Cardiff: University of Wales Press, 1994), Glyn Davies (pp. 332–333) points out that earlier examples of savings banks existed before 1810 in Britain and abroad. However, he argues that these earlier forms of savings banks "had little influence beyond their own localities, whereas Duncan's experiment quickly became imitated worldwide."
4. Actually, as we saw earlier, a person transferring funds from a depository intermediary to a money market mutual fund is not "disintermediating," but is transferring funds from one type of intermediary to another.

5. The now defunct FSLIC was the federally sponsored agency that insured the deposits of S&Ls for up to $100,000. It was dissolved in 1989. Since this time, S&Ls can obtain deposit insurance from the Savings Association Insurance Fund (SAIF), which is part of the Federal Deposit Insurance Corporation (FDIC).
6. We should point out that the bailout benefited taxpayers by maintaining the solvency of the financial system, even as it took place at taxpayers' expense.
7. Volume 13, no. 2 (Fall 2000), or www.fdic.gov/bank/analytical/banking/2000dec.
8. The NCUA is managed by a three-member board, one member of which serves as chair. Board members are appointed by the president of the United States and confirmed by the Senate. They serve staggered six-year terms.
9. For a discussion of how such state insurance funds have failed in the past, see Walker F. Todd, "Similarities and Dissimilarities in the Collapses of Three State-Chartered Private Deposit Insurance Funds," Federal Reserve Bank of Cleveland Working Paper no. 9411, October 1994.
10. Some bankers have begun suggesting that the FDIC should adopt a similar mutual ownership structure.
11. The Community Reinvestment Act (CRA) of 1977 requires banks and savings associations to meet the convenience and needs of the entire community (including low- and moderate-income areas) in which they are located. It was passed in response to allegations that banks were refusing to make loans to particular neighborhoods based on the racial and income composition of the area. The act requires lenders to document their lending patterns and community participation. Credit unions are exempt.

CHAPTER SEVENTEEN 17

The difficulty lies not so much in developing new ideas as in escaping from old ones.

—John Maynard Keynes

The people's right to change what does not work is one of the greatest principles of our system of government.

—Richard Nixon

Regulation of the Banking System and the Financial Services Industry

Learning Objectives

After reading this chapter, you should know:

Why regulation is needed in the financial services industry

Who regulates whom in the banking system

Some of the major pieces of legislation important to the banking industry today

Regulatory challenges facing Congress and the regulators

THE ROLE OF REGULATION

The ability of certain industries within a market economy to regulate themselves has been the subject of controversy for a long time. Some analysts believe that virtually no regulation is needed and that the market can handle practically every situation far better than a government regulatory agency. For example, they believe that airlines can regulate themselves better than a government regulatory agency can.[1] If an airline is unsafe, so the argument goes, it will experience more accidents than other airlines. As passengers become aware of this accident record, they will avoid flying on the unsafe airline, and it will be driven out of business. Likewise, the market can better regulate the financial services industry than any regulatory agency such as the Fed or the Office of Thrift Supervision can. According to this argument, a bank that takes too many risks will be driven out of business when cautious depositors become aware of the risks and withdraw their deposits or when the bank sustains losses and is unable to pay back depositors.

At the other extreme are those who believe that the economy needs a lot of regulation because the quest for profits is so strong that, without regulation, consumer welfare will likely be jeopardized. For example, an airline may skimp on costly maintenance to keep its planes in the sky because planes on the ground do not generate profit. Or a financial intermediary (FI) might take a large risk because the potential payoff is so big. After all, the bulk of the funds that the intermediary is risking belongs to the depositors.[2] Although the unsafe airline may eventually be driven out of business in a market economy, that doesn't bring back the loved ones who were killed in a plane crash because the airline failed to take reasonable safety precautions. Likewise, depositors may feel some satisfaction when the depository institution that lost their life savings is driven out of business, but the institution's demise does not reduce their pecuniary losses.

In Chapter 15, we discussed the Glass-Steagall Act, which was implemented in response to the financial collapse of the Great Depression. Glass-Steagall made the banking sector a highly regulated industry. Although the crisis in the Great Depression might suggest the need for some regulation, by the late 1970s sentiment in the United States had shifted to the belief that the economy had become a victim of overregulation. This change led to a deregulation movement that continues in varying degrees today. Industries such as the airlines, trucking, and financial services have been **deregulated.**

Deregulate
The dismantling of existing regulations.

After deregulation, some industries experienced severe stresses and bankruptcies, particularly in the 1980s. The financial services sector in particular went through the collapse of the savings and loan (S&L) industry, the largest wave of bank failures, and the most serious strains since the Great Depression. Some observers blamed deregulation at least to some extent for these problems. Others argued, however, that the failures were the result of previous regulations that had protected inefficient operations and that the problems would be resolved in time. Indeed, as we have seen, by the late 1990s, the banking system had recovered and made record profits. Although the industry did not fare as well in the downturn of the early 2000s, the recovery that followed pushed bank stock prices well above previous highs. Although the general trend was upward from 2001 to 2006, by October 2007, bank stock prices had fallen somewhat, primarily because of difficulties in residential mortgage markets. Most analysts were not prepared for the financial panic and crisis that would occur over the next year that would result in a series of the largest bank failures in history and a total collapse in financial stocks, and culminate in the unparalleled $700 billion bailout of the financial system.

The banking system, composed of depository institutions, is a major part of the financial services industry. In this chapter, we focus primarily on the regulatory structure of the banking system today and look at the major pieces of legislation that have created it. We begin with deregulation acts in 1980 and 1982 that removed many of the regulations imposed in the Great Depression. We look at the regulatory structure that was implemented in response to the financial crises of the 1980s and to new regulations that were designed in response to technological changes and the globalization of financial markets. We also look at recent sweeping (and proposed) legislation that promises to overhaul the banking system and the financial services industry. Finally, because of the growing integration of banking and financial services firms, we summarize the major regulators of the financial services industry in general.

THE HOW AND WHY OF FINANCIAL SERVICES REGULATION

"Free to compete" means "free to fail." Because the failure of a significant number of FIs will undermine the public's confidence in the system, there is a potential conflict between the two objectives of regulation: competition and efficiency, on the one hand, and safety and soundness, on the other hand. The regulatory authorities attempt to balance these objectives, or at least so they tell us, by issuing regulations that govern banks and other financial intermediaries.

As you have seen, most, if not all, bank activities were regulated by various government regulators from the Great Depression in the 1930s until the 1980s. Given the despair and disruption accompanying the Great Depression, the financial regulators wrote regulations that limited "price" competition, restricted entry, controlled the various types of products and services that banks and other FIs could offer the public, and specified prudent capital positions for intermediaries. Specific regulations included Regulation Q interest rate ceilings, chartering and branching restrictions, assets and liabilities restrictions, and net worth requirements.

During the 1980s, banks and most other intermediaries were substantially deregulated. A series of financial crises followed that culminated in widespread insolvencies within the S&L industry and many bank failures.[3] The crises triggered attempts at reregulation and the thought that regulations needed to be overhauled.

Throughout this text, we have repeatedly emphasized the role of regulation in ensuring the safety and soundness of the financial system. Regulations were deemed necessary because of the nature of the financial system and the trade-off between high returns for net lenders versus safety and soundness. As you have seen, FIs can earn higher returns by assuming more risks. Indeed, some intermediaries offer higher returns for the acceptance of more risks. Historically, depository institutions—within limits—have offered a guaranteed, albeit lower, return.

When deciding how much risk to take on, an FI should evaluate the risks of an activity. Generally speaking, when the expected benefits outweigh the expected costs, the activity will, on average, be profitable to undertake. However, in the process of assessing the expected costs associated with various levels of risk, the intermediary considers only the costs to the stockholders, creditors, and depositors that would result from an investment or portfolio of investments going sour.[4] Because they are so highly leveraged, some FIs may fail to adequately consider how much risk they should take and may ignore the costs to the community at large that could result from the failure of the institution. The collapse of an FI not only affects those directly involved but could conceivably impede the smooth functioning of a local community or the entire economy.

The failure could lead to a bank run and a simultaneous financial collapse. Thus, we arrive at the crux of the problem: If left to decide the level of risk on their own, banks or other intermediaries will generally accept too much risk because they fail to consider the additional costs of failure that the community at large must bear. If banks and other intermediaries were left unregulated, the drive for profits might jeopardize the goals of safety and soundness for the system as a whole.

Prior to the 1980s, regulations encouraged specialization that resulted in the segmentation of the financial services industry. For many decades, the industry remained highly segmented. The limitations on portfolios were predicated on the alleged benefits of compartmentalizing FIs into various specialties. Insurance companies were to specialize in insurance and banks in banking and "never the twain shall meet." Thus, in the belief that competition needed to be limited among the compartments, the regulators effectively divided the financial markets.

Slowly, over time, however, barriers between intermediaries began to break down as financial institutions made inroads into each other's areas of specialty. The segmentation gave way as banks increasingly engaged in traditionally nonbanking activities, and nonbanks increasingly engaged in traditional banking activities. Finally, in 1999, landmark legislation underwrote the changes in the marketplace by allowing the full financial integration of banking, securities, and insurance firms as opposed to their segmentation into separate entities. Some analysts believe that this piece of legislation contributed to the financial crisis of 2008.

Historically, the regulatory structure was as segmented as the financial services industry. As the industry segmentation broke down, however, the regulatory segmentation failed to break down along with it.[5] Who said government bureaucrats were flexible anyway? Today, however, although the historical segmentation of regulatory responsibilities persists, we expect that the brute forces of events, (the financial crisis of 2008), will hasten the pace of change.

Regulation can focus on either financial markets (products) or financial institutions. For example, stocks, bonds, and futures are financial products that are regulated, and banks, S&Ls, and insurance companies are financial institutions that are regulated. In addition, sometimes a particular financial product or institution may be regulated by more than one agency, and a single agency may regulate more than one financial product or institution. Given this background, now would be a good time to look at the accompanying "A Closer Look" feature, which surveys the many agencies currently regulating the financial services industry. Many of these nonbanking system regulators are covered in more depth in subsequent chapters.

A final point needs to be reiterated. The regulatory structure of the financial services industry is in a process of ongoing change for several reasons, including the continuing evolution of the industry, resulting in new products and markets; the ongoing financial crisis of 2008 noted above; technological changes in the delivery of financial services; and the globalization of financial markets. All of these changes leave many concerns about the adequacy of current regulations. In early 2008, the U.S. Treasury announced a proposal to overhaul the U.S. financial regulatory structure. Now would be a good time to read the accompanying "Looking Forward" feature titled "A Proposal to Overhaul the Financial Regulatory Structure." Although we are not certain which of these proposals will be adopted, it seems clear that there will be major regulatory reform in the next few years.

Regulators in the Financial Services Industry

- Banks: We have already discussed the dual banking system in which federal and state-chartered banks exist side by side. Federal banks are regulated by the Office of the Comptroller of the Currency (OCC), the FDIC, and the Fed. State banks are regulated by the state banking commissioner and possibly the Fed and/or the FDIC, depending on whether they choose to be members of the Fed and/or subscribe to deposit insurance. With regard to reserve requirements, all banks are regulated by the Fed.
- Bank holding companies and financial holding companies are regulated by the Federal Reserve. However, unless the Fed suspects a problem, it relies on the reports of a subsidiary's functional regulator such as the Securities and Exchange Commission (SEC) or the state insurance commission.
- Savings and loan associations: S&Ls are regulated by the Office of Thrift Supervision (OTS) of the Treasury and, with regard to reserve requirements, the Fed. Those that subscribe to deposit insurance are also regulated by the FDIC.
- Credit unions: Federally chartered credit unions are regulated by the National Credit Union Administration, while those with state charters are regulated by state banking commissioners. The National Credit Union Share Insurance Fund insures deposits in credit unions up to $100,000. Because they are nonprofit, tax-exempt institutions, credit unions have generally engaged in less risk taking than their for-profit competitors, and consequently they have experienced much milder strains. They have larger reserves and fewer losses. Unlike other depository institutions, credit unions do not pay an insurance premium but put up capital equal to 1 percent of their insured deposits with the insurance fund. If this reserve is ever depleted because of losses, credit unions are required to replenish it out of capital.
- Finance companies: Finance companies must obtain permission to open an office for business from the state in which they want to operate. Once that permission is obtained, there are virtually no restrictions on branching. The Federal Trade Commission (FTC) regulates finance companies with regard to consumer protection. However, there are no restrictions on the assets they hold or how they raise their funds other than those generally applying to the issuance of securities.
- Financial futures: Financial futures are regulated by the Commodity Futures Trading Commission and the National Futures Association. The latter was set up by the industry for self-regulation.
- Financial options: Financial options are regulated by the SEC, which was established in 1933. Options on futures are regulated by the Commodity Futures Trading Commission. The Options Clearing Corporation has been set up by the industry for self-regulation.
- Mutual funds: The SEC was given regulatory control over mutual funds by the Investment Company Act of 1940. Regulations include requirements to publicly disclose financial information and restrictions on how business can be solicited. Mutual funds experienced tremendous growth in the 1980s and early 1990s. As a result, some observers believe that additional regulation may be needed for two reasons: (1) Sales offices for mutual funds are now allowed to be located inside commercial banks, even

though the funds are not sold directly by the bank. Apparently, a significant portion of customers erroneously believe that mutual funds purchased in a bank are insured by the bank. (2) Mutual funds have grown to be a significant portion of total intermediation, while the regulatory structure has not grown at the same pace.

- Insurance companies: Insurance companies are regulated by the insurance commissioner of the state in which they do business.
- Pension funds: Pension funds are regulated by the Department of Labor. The Pension Benefit Guaranty Corporation provides insurance in the event that a pension plan is unable to pay the benefits defined in the pension agreement. The pension rights of more than 40 million Americans are protected by this insurance. In other words, if a plan cannot pay pension benefits because it invested the premiums poorly or because it was not funded properly to begin with, the Pension Benefit Guaranty Corporation will pay the benefits according to the contract and make up any payment deficiencies up to a limit.
- Stocks and bonds: Securities markets including brokers and dealers are overseen by the SEC. The SEC requires that companies fully disclose their financial condition before issuing bonds and while the bonds are outstanding. Likewise, issuers of new securities must register with the SEC and disclose all important financial information. If the equities are to be publicly traded, ongoing disclosure is required, and insider trading, which is trading of securities by those who have access to information about the companies involved before it is made public, is forbidden. Margin requirements specify the maximum percent of borrowed funds that can be used in a stock purchase. The Fed sets margin requirements for the purchase of stocks and bonds.
- Securities firms: Securities firms are regulated by the SEC, the New York Stock Exchange (NYSE), and other exchanges. In addition, securities firms are self-regulated by the National Association of Securities Dealers. The Securities Investor Protection Corporation insures retail customers of securities brokerage firms for up to $500,000 of their portfolios in the event the brokerage firm becomes insolvent.
- U.S. government securities: U.S. government and U.S. government agency securities are regulated by the Fed and the SEC.
- Government Sponsored Enterprises associated with the housing market (Fannie Mae and Freddie Mac) and the Federal Home Loan Banks: The Federal Housing Finance Agency (FHFA) was created in July 2008 in response to the ongoing financial crisis to oversee the agencies that dominate the secondary mortgage markets. Fannie Mae and Freddie Mac were put into conservatorship by the FHFA in September 2008.

Because the regulatory structure will continue to change as the financial services industry evolves, innovative regulations for new and existing markets and products may be just around the corner.

Recap Regulation must balance the goals of competition and efficiency versus safety and soundness. FIs should balance the expected benefits and expected costs of assuming various levels of risk. Initially, regulation encouraged market segmentation and, hence, regulation was segmented. Although segmented markets are breaking down, regulations have been slower to change. Either financial products or financial institutions can be regulated. The regulatory structure is in the process of ongoing change because of the evolution of the financial services industry.

A Proposal to Overhaul the Financial Regulatory Structure

The subprime lending crisis of 2008 that spread to the entire global financial system highlighted lapses in the financial regulatory system. Even before this crisis, policy makers recognized the need to overhaul an outdated regulatory system. The globalization of finance and the plethora of financial innovations had made the financial system very different from what it was a few decades earlier. In March 2007, the U.S. Treasury "convened a blue-ribbon panel to discuss U.S. capital markets competitiveness." Out of this panel came the recognition that the competitiveness of the financial services industry was negatively impacted by an outdated regulatory structure. Therefore, in June 2007, the Treasury began work on a series of recommendations to modernize the regulatory system.

On March 31, 2008, Treasury Secretary Henry Paulson released the "Treasury's Blueprint for Financial Regulatory Reform."[a] The blueprint proposes a new regulatory framework that would be composed of three regulators, each with a different function. The goal of regulating by function was to make the regulatory structure more resilient to innovations within the financial system that could render current regulations inadequate or obsolete.

The first regulator would focus on financial stability across the entire financial system. This would protect against systemic risk, which is the risk that a collapse in one market will spread to the rest of the economy and result in a downturn. Not surprisingly, the Treasury recommends that the Fed perform this role. In doing so, the Fed's regulatory powers would be broadened from financial holding and bank holding companies to investment banks, insurance companies, hedge funds, private equity firms, and virtually any other financial institution or market whose financial practices could pose a threat to the financial stability of the economy. The Fed would have the power to oversee the capital adequacy, liquidity, and lending practices of any such financial institution or market.

The second regulator would concentrate on ensuring the safety and soundness of institutions such as banks and savings associations that had federally guaranteed deposit insurance. Presently, banks are regulated by the Office of the Controller of the Currency (OCC), and savings associations are regulated by the Office of Thrift Supervision (OTS). Under this proposal, banks and savings associations would both be chartered and regulated by the OCC and the OTS would be phased out.

The third regulator would protect consumers and investors from unfair lending practices and would monitor all financial institutions with regard to consumer protection. It would assume many of the roles of the Securities and Exchange Commission (SEC), which currently regulates stocks and bonds, and the Commodity Futures Trading Commission (CFTC), which currently regulates futures contracts. It would also take over many of the roles of banking and insurance regulators regarding disclosure. This would result in greater consistency in the disclosure to consumers of the risks involved with various financial products.

Finally, the report proposes maintaining the present state-level regulation of mortgage brokers and originators. However, it also recommends creating a Mortgage Origination Commission (MOC) to evaluate and oversee each state's regulation of the mortgage market. The MOC would then disclose states that were not adequately regulating mortgage brokers, and hence, whose mortgages may not be desirable for securitization. Concerning the mortgage crisis that began in 2006, it is now clear that many homebuyers who financed their purchase with a subprime loan did not understand the extent to which payments would increase over the next few years, and the buyers of the securitized loans were also not aware of how risky these loans were.

It is expected that the reforms to the financial regulatory system will be completed until sometime in 2009, and then adopted over the next several years after that. However, the ongoing financial crisis of 2008 may speed up the reform process and cause policy makers to take it far more seriously.

Endnote

a. **http://www.treasury.gov/press/releases/hp897.htm.**

We now turn our attention to the most recent pieces of regulatory legislation: those governing the banking system from the 1980s to the early years of the new millennium.

DEPOSITORY INSTITUTIONS DEREGULATION AND MONETARY CONTROL ACT OF 1980 AND THE GARN–ST. GERMAIN ACT OF 1982: DEREGULATION IN THE EARLY 1980S

The burdens associated with complying with the regulations and the benefits associated with innovating around them produced numerous forms of adaptive behavior by banks and other FIs. For example, banks developed new types of liabilities to sidestep Regulation Q (interest rate ceilings that could be paid to depositors) and reserve requirements. These new types of liabilities included borrowings in the fed funds, negotiable CDs, repurchase agreements, and Eurodollar markets. Because these new types of liabilities were borrowings, not deposits, they were not subject to interest rate caps or reserve requirements. Banks also used the holding company corporate form to evade certain entry and branching restrictions and to engage in nonbanking activities. The financial regulations and structures that had been designed and erected during the Great Depression were increasingly ill suited to the changing economic and technological environment of the 1970s. As innovations weakened the effectiveness of various regulations, regulators recognized the difficulty, if not the impossibility, of controlling financial flows and the market for financial services. Accordingly, Congress decided to deregulate by dismantling the regulations. Landmark legislation enacted in 1980 and 1982 was the result.[6]

Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA) The statute that removed many of the regulations enacted during the Great Depression; it phased out Regulation Q, established uniform and universal reserve requirements, increased the assets and liabilities that depository institutions could hold, authorized NOW accounts, and suspended usury ceilings.

The first legislation was the **Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA).** Its numerous provisions reflect the compromises necessary to enact such an all-encompassing piece of legislation. As its title suggests, however, the major provisions of interest to us can be divided into two groups:

1. Deregulation
   a. The remaining Regulation Q ceilings were phased out over a six-year period that ended in 1986.

b. Asset and liability powers of banks and thrifts were expanded.
   (1) Assets: S&Ls and savings banks were allowed to extend loans to businesses and offer more services to customers.
   (2) Liabilities: All depository intermediaries were permitted to offer NOW accounts (interest-bearing checkable deposits) to households.
   (3) State **usury ceilings** (maximum interest rates FIs are allowed to charge borrowers on certain types of loans) were suspended.

2. Monetary control
   a. All depository institutions were subject to reserve requirements (so-called **universal reserve requirements**).
   b. Reserve requirements were to be the same on particular types of deposits across institutions (so-called **uniform reserve requirements**); this provision was phased in over an eight-year period that ended in 1987.

Usury Ceilings
Maximum interest rates that FIs may charge on certain loans.

Universal Reserve Requirements
Reserve requirements to which all depository institutions are subject.

Uniform Reserve Requirements
Reserve requirements that apply to particular types of deposits and are the same across all depository institutions.

In general, the deregulation provisions put some explicit price competition back into banking and permitted more competition among depository institutions. As a result, banks and thrifts would be more alike in terms of the products and services offered to the public. Congress hoped that the net result of more competition would be greater efficiency, an accompanying reduction in costs, and an improvement in the quantity and quality of financial services.

By mandating universal and uniform reserve requirements, the act strengthened the effectiveness of the regulatory process and expanded the powers of the Fed. Henceforth, when the Fed changed the amount of funds available for reserves, its control over the money supply and supply of loanable funds would be more direct. All in all, the DIDMCA was a landmark piece of legislation that brought many long overdue changes to the financial structure—changes that had been recommended by numerous federal studies over the previous 20 years.

Two years later, the Garn–St. Germain Depository Institutions Act of 1982 was enacted. Like its 1980 predecessor, the 1982 act had many provisions. Chief among them were those that speeded up the pace of deregulation by allowing depository institutions to offer two types of deposit accounts designed to compete directly with money market mutual funds: (1) money market deposit accounts, which have no rate ceiling and permit six third-party payments transactions per month, and (2) Super NOW accounts, which also have no rate ceiling but are fully checkable.

Since this legislation was enacted, competition among FIs and between FIs and the open market has increased dramatically. For example, depository institutions now offer rates on all deposit liabilities that are closely correlated with market rates. Such dramatic changes in the competitive environment within which banks and other FIs operate have noticeable effects on the portfolio behavior and operations of depository institutions.

Recap Because market participants had found ways around many regulations, Congress passed two major statutes that deregulated financial markets. The DIDMCA in 1980 phased out Regulation Q ceilings and expanded the asset and liability powers of banks and thrifts. It also established uniform and universal reserve requirements for all depository institutions. The Garn–St. Germain Act of 1982, among other things, authorized money market deposit accounts and Super NOW accounts.

Basel Accord—The Introduction of International Capital Standards

Bank capital is the difference between bank assets and liabilities. It acts as a "cushion," protecting an FI from bankruptcy in the event of a decline in the value of its assets. Until

Looking Out

Basel Committee Announces 25 Core Principles for Effective Bank Supervision

The Asian meltdown of 1997–98 demonstrated how crisis prone the international financial system can be as financial markets become more globalized. Long before this crisis, the Basel Committee on Banking Supervision had related concerns and was meeting on a regular basis at the Bank for International Settlements in Basel, Switzerland. The committee consists of central bank governors from the G-10 countries. Its goal is to improve banking supervision at the international level and enhance international financial stability.

In September 1997, the Basel Committee announced 25 core principles that the committee believes must be in place for a supervisory system to be effective. In addition to the G-10 nations, 15 other emerging economies participated in the discussions. Supervisory authorities throughout the world were asked to endorse the principles by October 1998. Endorsement includes a review of current supervisory arrangements and the changes that would have to be implemented for a country to be in compliance with the principles.

The core principles address "the preconditions for effective banking supervision, licensing and structure, prudential regulations and requirements, methods of ongoing banking supervision, information requirements, formal powers of supervisors and cross-border banking."[a] They are intended to serve as a reference for regulators to apply when supervising banks in their countries. In addition, the principles are designed to be verifiable by domestic and international regulators and the market. It is hoped that if countries strengthen areas where they fall short of the core principles, domestic and international financial stability will be improved.

Endnote

a. Press Release, Bank for International Settlements (September 23, 1997).

1980, banks were pretty much free to establish their own capital requirements as the Fed and other regulators pursued different avenues of control such as reserve requirements, asset restrictions, chartering, and Regulation Q. Since the deregulation of these traditional avenues of regulation in the early 1980s, regulators have attempted not only to impose stricter capital requirements but also to use them as a primary vehicle of regulation.

Basel Accord
A 1988 agreement among 12 countries that established international capital standards for banks.

The trend toward stricter standards received further impetus in November 1988, when the United States and 11 other countries entered into the **Basel Accord,** which established uniform international capital standards for banks. The accord specified the amount of capital that banks must hold relative to assets. This standard was stricter than that imposed on U.S. banks at the time and involved risk-based capital standards for the first time. Thus, the amount of capital a bank was required to hold was based not only on total assets and liabilities but also on the measurable riskiness of those assets. Despite the regulators' efforts, many banks were holding less capital relative to assets than the

Bank Capital Standards Under the Basel Accord (Basel I)

The Basel Accord established requirements for core capital and for total capital. Core capital is by definition the historical value of outstanding stock plus retained earnings. Total capital is core capital plus supplemental capital (loan-loss reserves plus subordinated debt). Subordinated debt is long-term debt that is paid off after depositors and other creditors have been paid in the event that the institution goes under. The amount of capital that must be held is based on the larger of two measures: one measure is based on risk-adjusted assets and the other on total assets.

The method based on risk-adjusted assets assigns different weights to different types of assets according to their risks. For instance, ordinary loans are counted at 100 percent of their value; mortgages are counted at 50 percent. Only half of the value of mortgages is counted because the property is held as collateral and repossessed in the event of default. Deposits between banks (interbank deposits) count at 20 percent, and T-bills and cash count at zero percent. In addition, off-balance-sheet activities that result in an obligation or potential obligation for the bank are also counted in risk-adjusted capital at their full value. For example, if a bank gives a standby letter of credit for $1,000, that letter of credit is counted at its full value ($1,000) in calculating risk-adjusted assets, even though it is not an asset. The reason for this is obvious. If the standby letter of credit is exercised, the bank stands to lose $1,000 just as if it had made a bad loan. For safety, a bank with off-balance-sheet activities that expose the bank to greater risk must maintain more capital. The risks of some activities such as futures, options, and swaps may be difficult to evaluate, however.

Once risk-adjusted assets have been determined, they are subject to two capital constraints: (1) core capital must be equal to at least 4 percent of risk-adjusted assets and (2) total capital must be equal to at least 8 percent of risk-adjusted assets. At the present time, risk-adjusted assets take into account only credit risk. They do not consider interest rate, liquidity, or exchange rate risks. Additional requirements that consider these risks may be implemented in the future.

In addition to the constraints based on risk-adjusted assets, banks are also subject to a leverage requirement stated in terms of total assets. In this case, all assets are weighted at 100 percent, and there is no accounting for off-balance-sheet activities. (The weight assigned to off-balance-sheet activities is zero.) According to the Basel Accord requirements, a bank must have core capital equal to at least 3 percent of total assets.

The use of international capital requirements has many desirable effects. All banks from the countries that abide by the standards are put on a more or less equal footing. The following table provides an example of how the standards are implemented under what has come to be known as Basel I.

Core Capital	$775,000	
Stock issued	500,000	
Retained earnings	275,000	
Total Capital	1,535,000	
Core capital	775,000	
Loan-loss reserves	260,000	
Subordinated debt	500,000	
Risk-Adjusted Assets		
Loans	$14,000,000 @ 100%	$14,000,000
Mortgages	3,500,000 @ 50%	1,750,000
Interbank deposits	2,000,000 @ 20%	400,000
Government securities	3,000,000 @ 0%	0
Reserves	1,800,000 @ 0%	0
Standby letters and other lines of credit	3,000,000 @ 100%	3,000,000
Total Risk-Adjusted Assets		$19,150,000
Total Assets		
Loans	$14,000,000 @ 100%	$14,000,000
Mortgages	3,500,000 @ 100%	3,500,000
Interbank deposits	2,000,000 @ 100%	2,000,000
Government securities	3,000,000 @ 100%	3,000,000
Reserves	1,800,000 @ 100%	1,800,000
Standby letters and other lines of credit	3,000,000 @ 0%	0
Total Assets		$24,300,000

Core capital must equal at least 4% of risk-adjusted assets:
$4\% \times \$19{,}150{,}000 = \$766{,}000$
Total capital must equal at least 8% of risk-adjusted assets:
$8\% \times \$19{,}150{,}000 = \$1{,}532{,}000$
Core capital must equal at least 3% of total assets:
$3\% \times \$24{,}300{,}000 = \$729{,}000$
As noted in the body of the text, very large complex banking institutions will be subject to additional capital requirements under Basel II.

new regulations required. Thus, as a result of the accord, many U.S. banks had to alter their behavior—to shore up bank capital relative to assets—in the early 1990s to meet the stricter standards. "A Closer Look" explains these standards and gives an example of how they are implemented.

The original Basel Accord, now known as Basel I, is believed to have achieved its primary goal of promoting financial stability by imposing risk-based international standards for banks. However, as some banking institutions have become more complex and as risk-management strategies have become more sophisticated, the need for additional standards for the largest and most complex banking institutions has been recognized. These institutions use instruments and procedures whose risk is not adequately measured under Basel I.

Changes to the accord, known as Basel II (or officially, The International Convergence of Capital Measurement and Capital Standards: A Revised Framework), were

issued by the Bank for International Settlements (BIS) in June 2004. As of mid-2007, details of U.S. implementation were still being negotiated by the "notice of proposed rulemaking" committee comprised of representatives from the primary U.S. regulatory authorities: the Federal Reserve, the Office of the Comptroller of the Currency, the Office of Thrift Supervision, and the Federal Deposit Insurance Corporation. In July 2007, these U.S. regulators agreed on a schedule for implementation and monitoring through 2008.

The basic objective of the Basel II framework is to more precisely measure the actual risks that banks face and determine required capital levels accordingly. A key aspect of the new framework is increased flexibility. It provides institutions with the opportunity to adopt approaches most appropriate to their situation.

Basel II consists of three primary components or "pillars." The first sets minimum capital requirements that firms are required to meet in order to cover credit, market, and operational risk. The second creates a new supervisory review whereby financial institutions have their own internal processes—processes that allow them to assess capital needs and to appoint supervisors to evaluate their overall risk profile in order to ensure adequate capital is held. The third aims to improve market discipline by requiring firms to publish details regarding their risks, capital, and risk management.

FINANCIAL INSTITUTIONS REFORM, RECOVERY, AND ENFORCEMENT ACT OF 1989—REREGULATION IN RESPONSE TO FINANCIAL CRISIS (BAILING OUT THE THRIFTS)

The Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) was signed into law in August 1989. The FIRREA was passed in response to the S&L crisis of the 1980s and was an attempt at reregulation following the deregulation and subsequent crises of the 1980s (see Chapter 16). The provisions of the FIRREA include the following:

1. An initial $50 billion was injected into the newly created Savings Association Insurance Fund (SAIF). The SAIF was established to provide insurance for the deposits of S&Ls, thereby replacing the Federal Savings and Loan Insurance Corporation (FSLIC). Additionally, the SAIF provided funding for the government takeover of failed S&Ls. The original $50 billion was raised by selling bonds known as bailout bonds, and the money was used to compensate institutions that took over a failed S&L by making up the difference between the value of the assets and liabilities of the defunct institution. Administration of the SAIF was made the responsibility of the Federal Deposit Insurance Corporation (FDIC). The FSLIC was dissolved. It had virtually gone bankrupt because of the crisis of the 1980s and was unable to cover the losses of insured deposits.
2. Two new government agencies were created. The **Office of Thrift Supervision (OTS)** was established to oversee the S&L industry, replacing the **Federal Home Loan Bank Board.** The **Resolution Trust Corporation (RTC)** was set up as a temporary agency to dispose of the properties of the thrifts that failed between January 1, 1989, and July 1, 1995. The FDIC was put in charge of the RTC, and the board of the FDIC was expanded from three to five members with the addition of the director of the OTS and an additional appointment by the president of the United States.
3. For the first time, deposit insurance was made a full faith and credit obligation of the federal government rather than the FDIC. Until 1989, neither Congress nor the taxpayers were legally required to bail out an insolvent deposit insurance company, whether it be the FDIC or the FSLIC. In reality, the government was de facto required to bail out a failed deposit insurer, as it did with the FSLIC, but only because

Office of Thrift Supervision (OTS)
An agency created by the FIRREA to replace the Federal Home Loan Bank Board as the overseer of the S&L industry.

Federal Home Loan Bank Board
The regulatory body of the S&L industry until 1989.

Resolution Trust Corporation (RTC)
An agency created by the FIRREA to dispose of the properties of the failed S&Ls.

failing to do so might cause a system-wide collapse. Contrary to what most Americans thought, there was no legal responsibility for the bailout. The new deposit insurance funds, the SAIF and the Bank Insurance Fund (BIF), both under the FDIC, were required to maintain reserves of at least 1.25 percent of insured deposits. Premiums paid are a percentage of total domestic deposits, including deposits of more than $100,000.

4. New regulations restricted the investments of S&Ls by limiting commercial mortgage lending and by phasing out junk bond investments by 1994. Investments in junk bonds had first been authorized in 1982 by the Garn–St. Germain Act. In addition, S&Ls were required to hold at least 70 percent of their assets as mortgages or mortgage-backed securities. Commercial real estate loans were restricted to 400 percent of total capital.
5. Capital requirements were imposed on the S&Ls. The requirements were similar to those placed on banks under the Basel I Accord. Risk-based capital standards were phased in, just as they had been for banks in participating countries (see "A Closer Look" on pages 413–414). Core capital for S&Ls was to be 3 percent, and total capital was to be at least 8 percent of risk-adjusted assets. These new requirements more than doubled the amount of capital that had to be held under the previous standards. To demonstrate the extent to which the industry has recovered, as of June 30, 2007, the total capital-to-asset ratio of S&Ls was 10.56 percent, which is higher than it was in the 1940–1970 period, when the ratio fluctuated around 7 percent.

FEDERAL DEPOSIT INSURANCE CORPORATION IMPROVEMENT ACT OF 1991—TIGHTENING UP DEPOSIT INSURANCE

Although it might seem that deposit insurance would solve the problem of excessive risk taking by protecting small depositors in the event of a depository institution's insolvency, deposit insurance actually increases the problem of excessive risk taking: it reduces market discipline because depositors no longer have to be concerned about the level of risk their bank engages in. This is the moral hazard problem introduced in Chapter 4. It occurs because the presence of deposit insurance causes financial intermediaries to take more risks than they otherwise would; they know that if they lose, their depositors will still get their funds back.[7] This encourages more risk because the greater the risk, the greater the possibility of higher returns. It's like going to Las Vegas to gamble with your neighbor's funds with the understanding that if you win, you get to keep the winnings and if you lose, your neighbor still gets paid back, but not by you.

Federal Deposit Insurance Corporation Improvement Act (FDICIA)
Legislation passed by Congress in 1991 to enact regulatory changes that ensure the safety and soundness of the banking and thrift industries. Regulators had long wished to merge the two separate deposit insurance funds, and the Federal Deposit Insurance Reform Act of 2005 accomplished this when signed into law by the president in early 2006.

In response to growing concerns about this problem, Congress passed the **Federal Deposit Insurance Corporation Improvement Act (FDICIA)** in 1991. The FDICIA attempted to secure the safety and soundness of the banking and thrift industries (S&Ls, savings banks, and credit unions) through several reforms. First, insurance premiums were scaled to the risk exposure of the banks or thrifts. However, in years when the insurance fund had adequate reserves, no institutions were charged premiums for deposit insurance despite their risk exposure. Second, FDICIA limited insurance coverage of regular and retirement accounts to a maximum of $100,000 per depository institution.[8] Third, the FDIC established a system that rated banks and savings institutions by their capital adequacy. Undercapitalized institutions were then categorized as undercapitalized, significantly undercapitalized, and critically undercapitalized, and institutions in each category subjected to appropriate treatment. The greater the degree of undercapitalization, the more severe the restrictions on the bank's operations. Fourth, the ability of foreign banks to use certain categories of deposits in the United States was

limited, so they could only keep insured deposit accounts through insured U.S. subsidiary banks.

The fifth change required the FDIC to use the least costly method to resolve any insolvency. Previously, an insolvency could be resolved by either the **payoff method** or the **purchase and assumption method.** Under the payoff method, depositors of a failed institution are paid off, the assets are liquidated, and the institution is closed. Depositors with balances of more than $100,000 lose the balances over $100,000. Under the purchase and assumption method, an insolvency is resolved by finding a buyer for the failed institution. In this case, all deposit liabilities (even those above the $100,000 limit) are assumed by the purchasing institution, and depositors do not lose anything. The payoff method is usually cheaper for the FDIC. Being required to use the least costly method to resolve insolvencies makes the purchase and assumption method a more attractive alternative for disposing of insolvent banks that are **"too-big-to-fail."** Under the "too-big-to-fail" practice, which was adopted by FDIC regulators in 1984, the failure of a large bank would be resolved using the purchase and assumption method rather than the payoff method, thereby freeing the FDIC from insuring deposits of more than $100,000. Despite this provision, though, if the bank failure would result in a systemic risk (a risk to the entire financial system), the least costly method would not have to be used. An exception requires the approval of the U.S. Treasury in consultation with the president and the approval of two-thirds of the members of the Board of Governors of the Fed and the FDIC. Needless to say, an exception is unlikely to be granted unless the failure would cause serious adverse effects to the overall economy and the financial system. In the case of the failure of IndyMac Bank in July 2008, there were 10,000 depositors with balances over $100,000. In this case, the FDIC guaranteed 50 percent of the value of the deposits over $100,000. After the liquidation of IndyMac assets, it is not known if depositers with uninsured deposits will get any additional funds back.

Payoff Method
The method of resolving a bank insolvency by paying off the depositors and closing the institution.

Purchase and Assumption Method
The method of resolving a bank insolvency by finding a buyer for the institution.

"Too Big to Fail"
The position adopted by FDIC regulators in 1984 whereby the failure of a large bank would be resolved using the purchase and assumption method rather than the payoff method.

FEDERAL DEPOSIT INSURANCE REFORM ACT OF 2005—MERGING DEPOSIT INSURANCE FUNDS

Regulators had long wished to merge the two separate deposit insurance funds, and the **Federal Deposit Insurance Reform Act of 2005** accomplished this when signed into law by President George W. Bush in early 2006. Effective March 31, 2006, the Bank Insurance Fund and Savings Association Insurance Funds were merged into the new **Deposit Insurance Fund (DIF).** Additional changes include the following:

1. Increasing the coverage limit for retirement accounts to $250,000 while keeping the limit at $100,000 for ordinary accounts. In addition, both coverage limits were indexed to inflation beginning in 2010.
2. Setting a range from 1.15 percent to 1.50 percent, between which the FDIC Board of Directors may set the Designated Reserve Ratio (DRR), and allowing the FDIC to manage the pace at which the DRR varies within this range.
3. Eliminating the restrictions on premium rates based on the DRR and granting the FDIC Board the discretion to price deposit insurance according to risk for all insured institutions regardless of the level of the reserve ratio. This effectively eliminates cross-subsidization of more risky members of the insurance pool by healthier institutions.
4. Granting a one-time initial assessment credit (of approximately $4.7 billion total) to recognize institutions' past contributions to the fund.

The Reform Act and ancillary amendments also require completion or research that may affect future regulatory changes. The FDIC is required to study further potential

Federal Deposit Insurance Reform Act of 2005
The Reform Act that merged the BIF and SAIF into the deposit insurance fund (DIF), increased the deposit insurance coverage for retirement accounts to $250,000, and adjusted coverage.

Deposit Insurance Fund (DIF)
Result of the combination of the Bank Insurance Fund and Savings Association Insurance Fund, effective March 31, 2006.

changes to the deposit insurance system, the appropriate deposit base in designating the reserve ratio, and its contingent loss reserving methodology and how it accounts for losses. In addition, the Comptroller General is required to study the federal bank regulators' administration of the prompt corrective action program and recent changes to the FDIC deposit insurance system, as well as the organizational structure of the FDIC. Given the ongoing financial crisis of 2008, many believe that the FDIC will need an injection of funds from Congress to resolve the number of insolvencies that are occurring.

Finally, please note as a result of the Basel Accord, the FIRREA, the FDICIA, and the Reform Act of 2005, banks and other depository institutions are now subject to both risk-based capital standards and risk-based insurance premiums. We turn now to the Community Reinvestment Act, which was actually passed in 1977 but had little impact until more recently.

Recap

The Basel Accord of 1988 established international capital standards for financial institutions. Basel II, signed by representatives of 13 countries, revised capital standards for more complex banking institutions. The FIRREA of 1989 bailed out the S&L industry, imposed new risk-based capital standards on S&Ls, and restricted the assets that S&Ls could hold. The FDICIA of 1991 imposed risk-based insurance premiums and eliminated the "too-big-to-fail" practice by requiring the FDIC to resolve insolvencies in the least costly way. The Reform Act of 2005 merged deposit insurance funds into the Bank Insurance Fund and indexed coverage limits for accounts.

COMMUNITY REINVESTMENT ACT—OUTLAWING DISCRIMINATORY LENDING PRACTICES

Community Reinvestment Act
Legislation passed by Congress in 1977 to increase the availability of credit to economically disadvantaged areas and to correct alleged discriminatory lending practices.

Redlining
The practice of restricting the number or dollar amounts of loans in an area regardless of the creditworthiness of the borrower.

The original purpose of the **Community Reinvestment Act (CRA)** was to increase the availability of credit to economically disadvantaged areas and to correct alleged discriminatory lending practices. Minority borrowers and neighborhoods had long been the victims of **redlining.** Redlining refers to the practice of drawing a red line (or any colored line) around a certain area on a map and restricting the number or dollar amount of loans made in that area regardless of the creditworthiness of the borrower with respect to income or collateral.

The Community Reinvestment Act did not get much attention because it provided no means of enforcement for regulators to use. However, activist groups believed that many banks were not making significant efforts to comply with the law, and in recent years, many mainstream community groups have joined their calls for more stringent enforcement of the act.

During the late 1980s and the 1990s, a means of enforcing the act became available with the wave of bank mergers and acquisitions that began in the late 1980s and accelerated in the late 1990s. In deciding whether to approve a bank merger or acquisition, the Fed now assesses how well the bank is meeting the CRA's lending criteria, and compliance statements are judged critically.[9]

In 1995, CRA regulations were revised to make them more objective and performance oriented, as well as to reduce compliance and reporting costs for many banks. Under the new rules, banks are divided into three classifications: large retail, small retail, and wholesale or limited-purpose institutions. Large and small retail banks are evaluated principally on their performance in assessment areas, whereas wholesale and limited-purpose institutions are evaluated based on their nationwide performance, as long

as they have adequately addressed the needs of the assessment area. For large retail banks, current regulations establish performance goals for lending, investment, and service. Banks are rated "outstanding," "satisfactory," "needs to improve," or "substantial noncompliance." Most banks have received satisfactory or better ratings. Now all federal agencies responsible for supervising depository institutions conduct CRA examinations, and each institution's record is taken into account when considering an institution's application for deposit facilities. Bank performance in this area is often difficult to judge, however, because banks are required to practice nondiscriminatory lending while focusing on safety and soundness.

To the extent that the Community Reinvestment Act has forced financial institutions to recognize and respond to the changing demographics before they would otherwise have done so, the law has provided an important service to the industry and community. Many bankers found that as they developed new markets, products, and services to meet the needs of the community, these new activities would be quite profitable. However, some analysts also suggested that the CRA contributed to the financial crisis of 2008 by increasing the number of mortgages and other loans made to low income households that would later not be able to afford the loans.

INTERSTATE BANKING AND BRANCHING EFFICIENCY ACT OF 1994—THE DAWN OF NATIONWIDE BRANCHING?

Interstate Banking and Branching Efficiency Act (IBBEA)
A 1994 act that eliminated most restrictions on interstate bank mergers by June 1, 1997.

The **Interstate Banking and Branching Efficiency Act (IBBEA)** of 1994 eliminated most restrictions on interstate bank mergers and made interstate branching possible for the first time since the passage of the McFadden Act in 1927.[10] The law permits all bank holding companies to acquire banks anywhere in the nation as long as certain conditions are met. In addition, under the same conditions, banks in one state may merge with banks in another state, thus effectively branching. The conditions include meeting requirements for the safety and soundness of the institutions involved (they must be well capitalized and well managed) and making commitments to community reinvestment under the Community Reinvestment Act. Under no circumstances will banks be permitted to use a branch to generate deposits without considering community reinvestment needs. Prior to the law, some states had limited or put additional conditions on the acquisition of banks by out-of-state bank holding companies.

In addition, as of June 1, 1997, bank holding companies were permitted to convert their multiple banks in various states into branches of a single interstate bank. This reduced the costs of maintaining a separate board of directors for each bank and the costs of other duplicative overhead expenses. Whether significant savings will be realized remains to be seen.

We turn now to the final major piece of banking legislation in the twentieth century. With the passage of the Gramm-Leach-Bliley Act in 1999, the financial services industry of the twenty-first century is far different from that of the twentieth century.

THE GRAMM-LEACH-BLILEY ACT (GLBA) OF 1999—THE FINAL DEMISE OF GLASS-STEAGALL

Until 1999, the most significant piece of banking legislation in the twentieth century had been the Glass-Steagall Act of 1933, which separated investment and commercial banking, created the FDIC, and limited the range of assets and liabilities that a commercial bank could hold and issue. After 67 years, this act was effectively repealed with the passage of the Gramm-Leach-Bliley Act (GLBA) in November 1999. The new

landmark legislation became effective March 11, 2000, and it significantly impacts the financial services industry. Rather than segmentation among financial service providers, the act allows for considerable financial integration in the financial services industry.

Major Provisions of the Gramm-Leach-Bliley Act

Financial Holding Companies (FHCs)
Bank holding companies that have applied for and been certified by the Fed to engage in a wide range of financial and nonfinancial activities, including securities, insurance, and merchant banking activities and other financial or nonfinancial complementary activities.

GLBA allows bank holding companies that meet certain criteria to be certified as **financial holding companies (FHCs).** FHCs may engage in a broad array of financial and nonfinancial activities. To become an FHC, a bank holding company must file a declaration with the Fed that certifies that all of its depository institutions are well capitalized and well managed and have a "satisfactory" or better rating under the Community Reinvestment Act. An FHC may engage in the following activities:

1. Financially related activities including securities underwriting and dealing, insurance agency and underwriting activities, and merchant banking activities.
2. Other financial activities that the Fed determines to be financial in nature or incidental to financial activities.
3. Nonfinancial activities that the Fed determines are complementary to a financial activity and do not pose a substantial risk to the safety or soundness of depository institutions or the financial system.

The act also authorizes expanded powers for banks and their subsidiaries. Under the new law, banks are authorized to

1. underwrite and market municipal revenue bonds, and
2. own or control a "financial subsidiary" that engages in activities that national banks are not permitted to directly engage in if prior approval of the Office of the Controller of the Currency is received.

Under the GLBA, the Fed is given the ultimate responsibility for supervising FHCs. This is similar to its ultimate regulatory responsibility for bank holding companies. However, under the law, the Fed is to rely on reports of examination prepared by the subsidiary's primary functional regulator as much as possible. For example, the primary banking regulator may be the FDIC, the Fed, or the Office of the Controller of the Currency; for securities activities, the primary regulator is the Securities and Exchange Commission; and for insurance activities, the state insurance commissioner is the primary regulator. There are some exceptions, such as when the Fed believes that the activities of a subsidiary may pose a threat to an affiliated depository institution or if the subsidiary is in violation of any federal law that the Fed has jurisdiction to enforce.

As of March 2000, when the law became partially effective, 117 bank holding companies had been certified as FHCs. Full phase-in of the law became effective November 12, 2004, when financial subsidiaries of FHCs were allowed to engage in merchant banking activities. By April 2008, the number had increased to about 647.

Two important additional provisions of the GLBA protect consumers. The first requires that ATM operators post a notice of any fees that may be imposed and inform the consumer through an onscreen or paper message of the amount of the fee before the consumer is irrevocably committed to completing the transaction. The second includes a number of new requirements relating to the disclosure of financial information about consumers. Namely, financial institutions cannot sell information for marketing purpose and are required to disclose, prior to the opening of an account and at least annually thereafter, the institution's policies regarding the disclosure of nonpublic personal information to third parties.

A Time Line of Banking Legislation

During the twentieth century, the United States enacted a number of pieces of major banking legislation that shaped the industry and its evolution.

- 1913: The Federal Reserve Act created the Federal Reserve System.
- 1927: The McFadden Act prohibited interstate banking.
- 1933: The Glass-Steagall Act established the FDIC as a temporary agency, separated commercial and investment banking, established Regulation Q interest rate ceilings, and set the interest rate ceiling on demand deposits at zero percent.
- 1935: The Banking Act established the FDIC as a permanent agency.
- 1980: The Depository Institutions Deregulation and Monetary Control Act (DIDMCA) authorized NOW accounts nationwide, thereby ending the monopoly of commercial banks on checkable deposits; phased out Regulation Q; established uniform and universal reserve requirements; granted new powers to thrifts; eliminated usury laws; and increased deposit insurance from $40,000 to $100,000 per account.
- 1982: The Garn–St. Germain Act expanded the asset and liability powers of banks and thrifts; expanded the power of the FDIC to help troubled banks; and created money market deposit accounts and super NOW accounts.
- 1989: The Financial Institutions Recovery, Reform, and Enforcement Act (FIRREA) authorized a taxpayer bailout of the S&L industry; brought deposit insurance for thrifts under the FDIC; created the Resolution Trust Corporation, a temporary agency to dispose of the assets of failed institutions; and imposed new restrictions on S&Ls.
- 1991: The Federal Deposit Insurance Corporation Improvement Act (FDICIA) abolished the "too-big-to-fail" policy; limited brokered deposits; established new capital requirements for banks; established risk-based insurance premiums; gave the FDIC new powers to borrow from the U.S. Treasury; restricted activities of foreign banks; and insured state banks.
- 1994: The Interstate Banking and Branching Efficiency Act (IBBEA) as of June 1, 1997, allowed virtually unimpeded interstate branching by adequately capitalized and managed banks that meet CRA requirements.
- 1999: The Gramm-Leach-Bliley Act (GLBA) allowed banks, insurance companies, securities firms, and other financial institutions to affiliate under common ownership and to offer a complete range of financial services that had been previously prohibited; created financial holding companies (FHCs) that could engage in financially related activities, other financial activities, and complementary nonfinancial activities; expanded allowable activities for banks and their subsidiaries; and repealed key provisions of the 1933 Glass-Steagall Act that separated commercial and investment banking.
- 2005: The Federal Deposit Insurance Reform Act of 2005 merged the Bank Insurance Fund and Savings Association Insurance Fund into a new Deposit Insurance Fund (DIF). It also increased the coverage limit for retirement accounts to $250,000 and indexed this limit for both retirement and ordinary accounts beginning in 2010.
- 2008: The Emergency Economic Stabilization Act of 2008 authorized up to $700 billion to the U.S. Treasury to buy "toxic" assets. Among other things, the funds were used to shore up the capital of large banks that were in trouble, rather than buy toxic assets. The Act also established an insurance program for "troubled" assets.

THE EMERGENCY ECONOMIC STABILIZATION ACT OF 2008

The Emergency Economic Stabilization Act of 2008 (EESA)
A law enacted in September 2008 in response to the ongoing financial crisis that authorized the U.S. Treasury to purchase up to $700 billion of "toxic" securities.

Troubled Assets Relief Program (TARP)
The program under the EESA that initially authorized the U.S. Treasury to purchase up to $700 billion of "toxic" mortgage-backed securities from financial institutions. The TARP program was revised ten days after the EESA was signed. Under the revised TARP program, the Treasury would use the bailout funds to purchase newly-issued preferred stock in troubled institutions.

The **Emergency Economic Stabilization Act of 2008 (EESA)** was passed and signed into law on October 3, 2008 in response to the financial collapse of 2008. The Act initially authorized the U.S. Treasury to purchase up to $700 billion of questionable "toxic" mortgage-backed securities under the **Troubled Assets Relief Program (TARP).** $250 billion was available immediately and an additional $100 billion would be available upon submission of a progress report about how the original funds were used. Congress had to authorize the use of the remaining $350 billion. As of early 2009, Congress was expected to authorize the additional $350 billion to be spent under the direction of the new Obama administration.

On October 14, 2008, the TARP program was revised by the Treasury and the initial $250 billion would be used to purchase preferred stock in American banks under the Capital Purchase Program (CPP). The Treasury decided that it would be better to directly inject capital into the banks rather than purchasing the toxic assets. By the end of October 2008, nine of the largest American banks applied for and received $125 billion. The thought was that by shoring up the capital of banks, banks would begin lending again and the financial system would recover. In November 2008, the Treasury authorized the use of $40 billion of TARP funds to purchase preferred stock in the insolvent American International Group (AIG) which had been taken over by the government. Also in November 2008, three large insurance companies announced plans to purchase depository institutions to give them access to TARP funds. Finally, in November, the Treasury secretary officially announced that the TARP funds would not be used at this time to purchase "toxic" assets but rather that the funds would be used in other ways such as the CPP to support the financial system. In December 2008, the Treasury authorized the use of TARP funds to bailout General Motors and Chrysler. Through December 2008, TARP money continued to be used to buy preferred stock in large and small banks. By early January 2009, about $305 billion in the bailout funds had been spent with approximately $200 billion used to buy preferred stock in banks, $40 billion used to bailout AIG, an additional $45 billion invested in Citigroup and Bank of America (who had both participated in the CPP program), and $20 billion invested with the automakers and their financing subsidiaries. Some analysts criticized that the bailout funds were not used for their original purpose and merely supported large institutions that had created the problems. They also argued that the banks were not increasing their lending as the Treasury had expected, given the injection of capital.

EESA also temporarily increased the deposit insurance limit to $250,000 on all depository institutions' accounts to prevent disintermediation.

In addition to the EESA, the Obama administration was proposing an additional $800 billion-plus stimulus plan for the weakened economy in early 2009. However, the funds were used in a variety of ways to shore up the financial system including to inject capital into banks through the Capital Purchase Program (CPP).

Recap

The Community Reinvestment Act of 1977 was designed to eliminate discriminatory lending practices. The IBBEA of 1994 allowed unimpeded nationwide branching as of June 1, 1997. The GLBA of 1999 allowed for the certification of financial holding companies that could engage in banking, securities, and insurance activities. The GLBA effectively repealed the provisions of the Glass-Steagall Act, which separated commercial and investment banking. The EESA authorized $700 billion to bail out the financial system in response to the financial crisis of 2008 that was threatening the collapse of the entire financial system.

The Ongoing Bailout of the Banking System: Nationalization or Not?

As we have seen, the Emergency Economic Stability Act (EESA) authorized $700 billion in funds to bailout the financial system. The EESA created the Capital Purchase Program (CPP) whereby up to $250 billion was to be used to purchase preferred stock in American banks. By the end of October 2008, nine of the largest American banks applied for and received $125 billion and about 90 other banks applied for and had received an additional $75 billion. The thought was that by shoring up the capital of banks, banks would begin lending again and the financial system would recover.

By January 2009, about $305 billion in the bailout funds had been spent including the $200 billion used to buy preferred stock in the banks mentioned above, the $40 billion used to bailout the insurance giant AIG, an additional $45 billion invested in Citigroup and Bank of America (who had both participated in the CPP program and needed additional funding), and the $20 billion invested to bailout the auto makers and their financing subsidiaries.

Now regulators were debating about how to use the remainder of the $700 billion of funds that were authorized under the EESA. Below are some suggestions:

- Should the government continue to inject capital into the banking system on an as needed basis? So far, such injections have been criticized because banks have not increased their lending and the fragile financial system remains in a semi-frozen state.
- Should the government nationalize the banks? Nationalization means different things to different people. Some analysts would say that some banks have already been nationalized, given the large equity stakes the government has due to the previous capital injections. In addition, in late February 2009, the government became the largest shareholder in Citigroup by increasing their common stock holdings to 36 percent. (Citigroup had been the nation's first and largest financial holding company before running into hard times.) Many analysts consider this amount of control by one stakeholder to be virtual nationalization. In addition, the government has already "virtually" nationalized AIG by their huge equity position and many consider that Fannie Mae and Freddie Mac have been nationalized because of their conservatorship by the government. On the other hand, it may not be as important as it seems. The government, through the Fed, or other regulator, has supervisory and regulatory power over the banks and thus can wield a great deal of control over their behavior, even without actual ownership.
- Should the government create a super "Bad" bank that would be owned by the government and that would purchase toxic assets currently choking the global financial system? This idea is similar to what was done in 1989 when the Resolution Trust Corporation (RTC) was created to deal with the bad mortgages and to dispose of the repossessed properties from the savings and loan crisis. So far, policy makers have not done this. However, if other attempts fail, it may opt for a similar plan.

Such are the ideas that have been floating around with regards to how to mitigate the ongoing banking crisis.

To give us some idea of how the remaining EESA funds will be used, the Treasury Department announced a new Financial Stability Plan in late February 2009. Note that this plan will undoubtedly be revised (or dumped) going forward in response

to unfolding events. As of March 2009, the core of the Financial Stability Plan is the Capital Assistance Program (CAP) which is designed to make sure that banks have sufficient capital to meet current demands and additional demands in the event that the economy further deteriorates. The thought is that with the greater capital level, lending would actually increase as confidence would be restored. Banks would have sufficient capital to meet even deteriorating conditions in the economy that could lead to greater than expected further losses and additional bank failures without the plan.

Under the plan, qualifying financial institutions including all domestically owned banks, bank holding companies, financial holding companies, and savings and loans with assets greater than $100 billion would be required to undergo a one-time evaluation by federal regulators to determine if they have sufficient capital. Currently, there are nineteen such large institutions. Smaller banks and other depository institutions that are not required to participate in the CAP would be able to participate if they chose to. The institutions would be evaluated by their primary regulator, which may be the Fed, the FDIC, the Office of the Comptroller of the Currency, or the Office of Thrift Supervision, depending on the institution's charter. Each institution's capital must be found to be adequate to meet the challenging economic environment that is expected over the course of the next few years. The amount of capital each bank must have will be based on a "consensus" and a "worse than expected" scenario or forecast.

Thus, the plan is proactive rather than reactive. Rather than capital being injected as needed, the plan would try to see that banks have sufficient capital to meet current needs but also to withstand greater than expected losses if the current dire situation deteriorates even further. If an institution is found to need more capital, it will first be able to solicit private sources during the time its application for CAP funds is being reviewed. If it cannot raise the additional capital privately, it would get the needed capital from the CAP in exchange for newly-issued preferred stock in an amount between 1 and 2 percent of the institution's total risk-weighted assets. The terms of the preferred stock are:

- it will pay a 9 percent dividend annually and
- it will be convertible into common stock at a price that is 10 percent less than the common stock price on February 9, 2009.

If an institution needed "exceptional assistance," it could apply to issue preferred stock bought by the government in excess of the 1 to 2 percent limit. The conversion of the preferred stock to common stock would occur seven years after the security was issued if it had not been redeemed or converted to common stock at an earlier date. To be converted to common stock at an earlier date, the issuer must get the approval of the regulators.

Banks that had already participated in the CPP to shore up their capital would be able to also participate in the CAP. Banks could also trade their issuances of preferred stock under the CPP program for the preferred stock under the CAP program. This would give them greater flexibility with regards to converting the preferred stock to common stock. The conversion of securities from the CPP program to the CAP program would not be counted as part of the 1 to 2 percent of risk-weighted assets of the CAP program alone. Remember dividends to preferred stockholders are paid before common stockholders receive any dividends.

The deadline for an institution to apply to participate in the CAP is May 25, 2009 and the issuance of the new securities must be completed within six months of the application date.

Additional programs under the Financial Stability Plan include a Consumer Business Lending Initiative to aid secondary credit markets, a Public Private Investment Fund to raise private capital to buy legacy assets, and a Homeowner Affordability and Stability Plan to restrict or refinance mortgages to help families stay in their homes. We look at the proposal to help the mortgage problem in "A Closer Look: The Mortgage Bailout Plan" in Chapter 14.

Is the CAP a form of nationalization of the banks or not? The debate continues and it will be interesting to see how the government extricates itself from these equity positions.

However, in a Treasury White Paper released in late February 2009, the Treasury states that "The economy functions better when banking organizations are well managed in the private sector. U.S. government ownership is not an objective CAP. However, to the extent that significant government stake in a financial institution is an outcome of the program, our goal will be to keep the period of government ownership as temporary as possible and encourage the return of private capital to replace government investment. In addition, any capital investments made by Treasury under this plan will be placed in a separate trust set up to manage the government's investment in US financial institutions. The objective will be to create value for the taxpayer as a shareholder over time."[a]

Updated details of all programs to restore confidence in the financial system can be found online at www.FinancialStability.gov. "A Closer Look: The Fed's New Tool Kit" in chapter 10 discusses the enormous special lending facilities created by the Federal Reserve in addition to the EESA to mitigate the ongoing crisis.

Endnote

a. "Treasury White Paper: The Capital Assistance Program and It Role in the Financial Stability Plan," available online at the www.financialstability.gov.

OTHER POSSIBLE AREAS OF REFORM

By the turn of the century, many regulatory changes had already occurred, including the following: (1) scaling insurance premiums to the risk exposure of banks, (2) limiting foreign deposit coverage, (3) intervening early when a bank begins experiencing problems so that measures will be taken before bank capital is fully depleted, (4) ending the practice of "too big to fail," (5) increasing capital requirements, (6) expanding interstate banking, (7) allowing banks, securities firms, and insurance companies to affiliate under common ownership, (8) authorizing FHCs to engage in many previously prohibited financial and nonfinancial services, and (9) merging the deposit insurance funds of banks and savings and loans into one Deposit Insurance Fund. Despite these regulatory changes, many analysts perceive that the banking crisis of 2008 intensified the need for further reform of the regulatory structure.

Look again at "A Closer Look" on page 407. Current regulatory responsibility for the banking system (including banks and S&Ls) is distributed among four supervisory agencies: the FDIC, the Office of the Comptroller of the Currency, the OTS, and the Fed. Look at how many other regulators there are in the financial services industry. Many analysts think that the present system causes duplication of regulatory functions and bureaucratic delays. They believe that multiple, decentralized supervisory agencies

result in costly systems that potentially decrease the effectiveness and efficiency of bank supervision. In response to these concerns, the Treasury, the Fed, the FDIC, and state banking departments are working together to make bank regulations more consistent and to make bank examinations more efficient and less burdensome. At the present time, the impetus for additional major reforms in financial sector regulation has increased due to the ongoing crisis in the financial system. Congress is expected to make substantial regulatory changes in response to this crisis.

Although many regulatory changes have been made in recent decades, more will undoubtedly be needed and implemented in the future as financial markets continue to evolve and adapt to new technologies. Furthermore, some recent regulatory changes have reversed and nullified past restrictions. For example, the Grahmm-Leach-Bliley Act of 1999 effectively nullified a primary component of the 1933 Glass-Steagall Act, one of the most significant pieces of legislation to come out of the Great Depression. In 2008, the ongoing financial crisis is also facilitating the disappearance of the large investment banking firm. Note that Lehman Brothers has declared bankruptcy; Merrill Lynch has been bought by Bank of America; Bear Stearns has been bought by J.P. Morgan Chase, and Goldman Sachs and Morgan Stanley have converted their charters to bank holding companies. Although the goal, financial stability, may remain the same, regulations perceived as advancing this goal may change over time. Finally, profit-seeking financial firms will seek to exploit any regulatory anomaly. They may obey the letter of the law, but chances are they will circumvent the regulatory intent. Thus, firms may influence the nature of future regulatory changes deemed to be both prudent and effective. Creation of effective regulations requires anticipation of the likely responses of those being regulated.

In the next chapter, we look at insurance companies.

Summary of Major Points

1. Because the failure of a depository institution has system-wide repercussions, Congress has enacted legislation to regulate the financial services industry with the goal of averting such a failure. A segmented financial services industry resulted in a segmented regulatory structure.
2. Regulation is by institution group or financial market (product). All depository institutions are regulated by the Fed with regard to reserve requirements. The FDIC also regulates banks and thrifts that opt for federal deposit insurance. Many other regulatory agencies regulate specific institutions. In addition, agencies such as the SEC regulate stocks and bonds. Other agencies regulate other financial products such as futures and options. Some product groups establish self-regulatory bodies. At the present time, no agency is in charge of regulating the money market. The regulatory structure is in an ongoing evolutionary process.
3. Beginning in 1980, the banking system was deregulated. The Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980 phased out Regulation Q interest rate ceilings and expanded the asset and liability options for banks and thrifts. All depository institutions were allowed to offer interest-bearing checkable deposits, and S&Ls and savings banks were allowed to make business loans. DIDMCA also expanded the powers of the Fed by authorizing uniform and universal reserve requirements.
4. The Garn–St. Germain Depository Institutions Act of 1982 allowed all depository institutions to offer money market deposit accounts with no interest rate ceilings, permitted limited check writing, and guaranteed insurance for accounts of up to $100,000. The act also authorized Super NOW accounts, which are checking accounts that pay a market interest rate.

5. The Basel Accord, an agreement among 12 countries, sets uniform international capital requirements for financial institutions as a primary vehicle of regulation. Requirements for core capital and total capital are based on risk-adjusted assets and total assets. Core capital is the historical value of outstanding stock plus retained earnings. Risk-adjusted assets are calculated by assigning different weights to different types of assets, depending on risk. Basel II is revising the original capital requirements to more effectively regulate complex banking institutions.
6. The Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) of 1989 attempted to resolve the S&L deposit insurance crisis. It created the Office of Thrift Supervision and assimilated the defunct FSLIC into the FDIC. New regulations restricted the investments that S&Ls could make, and capital standards similar to those imposed on banks by the Basel Accord were adopted. Deposit insurance was made a full faith and credit obligation of the U.S. government, and bonds, which would eventually be paid off by taxpayers, were sold to obtain the funds necessary to bail out the defunct S&Ls.
7. The Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991 required higher deposit insurance premiums for banks and thrifts that undertake high levels of risk. The "too-big-to-fail" practice that had been in effect since 1984 was ended. Under the "too-big-to-fail" practice, the failure of large banks was resolved using the purchase and assumption method rather than the payoff method.
8. The Federal Deposit Insurance Reform Act of 2005 merged the two separate preexisting deposit insurance funds, one for banks and the other for S&Ls, into one Deposit Insurance Fund (DIF). It also indexed coverage limits to inflation, set a range for the size of the fund reserves, allowed the FDIC to choose the exact level of reserves and discretion to determine the speed of adjustment to desired reserve levels, and gave the FDIC more discretion in setting insurance premiums.
9. The Community Reinvestment Act of 1977 gained prominence in the late 1980s as the Fed used compliance with this act as a criterion for approving or disapproving bank mergers. The regulations were further revised in 1995, and now all banking regulatory agencies examine all depository institutions for CRA compliance. CRA requires banks to lend in economically disadvantaged areas and to end the practice of redlining.
10. The Interstate Banking and Branching Efficiency Act (IBBEA) of 1994 allowed interstate branching by mergers of well-capitalized and well-managed institutions as of June 1, 1997. Under this law, bank holding companies can also convert separate banks into branches.
11. With the passage of the Gramm-Leach-Bliley Act (GLBA) in 1999, the final vestiges of the Glass-Steagall Act separating investment and commercial banking were removed. The stage is set for full financial integration of the banking, securities, and insurance industries. The GLBA allows for bank holding companies to be certified as financial holding companies (FHCs) that can engage in financially related activities, including securities underwriting and dealing as well as insurance and merchant banking activities. The GLBA also allows FHCs to engage in other financial activities and complementary nonfinancial activities. Banks had previously found ways into the securities industry through bank holding company subsidiaries. They have been able to do this because the Fed has relaxed or weakened many of the provisions of Glass-Steagall.
12. The Deposit Insurance Reform Act of 2005 merged the Bank Insurance Fund (BIF) and the Savings Association Insurance Fund (SAIF) into the Deposit Insurance Fund (DIF). It also increased deposit insurance limits and indexed them to inflation.
13. The Emergency Economic Stabilizaton Act of 2008 (EESA) authorized the U.S. Treasury to purchase $700 billion in toxic mortgages and other assets that were causing the financial crisis and the drying up of credit extension. The $700 billion bailout was eventually used to shore up the capital of large financial institutions and for a variety of other uses.
14. Despite the enactment of higher capital standards and risk-based insurance premiums, many believe that the reforms do not go far enough in dealing with the moral hazard problem.

Key Terms

Basel Accord, p. **412**
Community Reinvestment Act, p. **418**
Deposit Insurance Fund (DIF), p. **417**
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Review Questions

1. How is the failure of an FI different from the failure of a video rental store? What do these differences imply about the need for regulation?
2. Discuss the major provisions of the FIRREA and the Reform Act of 2005.
3. What is redlining? How is the Community Reinvestment Act supposed to affect it? What are the classifications for depository institutions and the ratings under the current regulations? Could a bank be violating the law if it fails to lend to businesses located in the deteriorating downtown area?
4. What is the Basel Accord? Why is it desirable to have uniform international capital standards for banks? What is the difference between Basel I and II?
5. What is the intent of the 25 core principles for effective bank supervision?
6. Some contend that the passage of the IBBEA is having little effect on the banking industry. What is the basis of their argument? On what date were banks allowed to branch across state lines by merging with a bank in a different state?
7. What are the provisions of the Deposit Insurance Reform Act of 2005?
8. Would a wealthy individual with bank accounts of more than $100,000 prefer the FDIC to use the purchase and assumption method or the payoff method to liquidate failed banks? Why?
9. What is core capital? How do risk-adjusted assets differ from total assets?
10. Who regulates money markets? Capital markets?
11. What are the major provisions of the Depository Institutions Deregulation and Monetary Control Act of 1980? The Garn–St. Germain Depository Institutions Act of 1982? Which act expanded the powers of the Fed? How?
12. Explain the difference between risk-based capital standards and risk-based deposit insurance premiums.
13. What are the regulatory responsibilities of the Securities and Exchange Commission? What is insider trading? Who sets margin requirements?
14. Identify three self-regulating agencies and explain which industries they regulate. Speculate as to why an industry would self-regulate.
15. Explain the function of each:
    (a) National Credit Union Share Insurance Fund; (b) Pension Benefit Guaranty Corporation; (c) Securities Investor Protection Corporation; (d) FDIC
16. Explain the difference between the purchase and assumption method and the payoff method of resolving a bank insolvency. What does "too big to fail" mean?
17. What are the major provisions of the GLBA? What is an FHC? How does a bank holding company become an FHC? What conditions must be met to become an FHC?
18. Was investment banking effectively separated from commercial banking prior to the passage of GLBA? Explain.
19. What were the provisions of and purpose for the Emergency Economic Stabilization Act?

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

✓20. Assume that a bank has core capital of $1,000,000 and total capital of $2,000,000. Its total risk-adjusted assets are $25,000,000 and total assets are $30,000,000. According to the Basel Accord (Basel I), does the bank have adequate capital?

✓21. Assume that a bank has the following:

Stock issued	$15,000,000
Retained earnings	2,750,000
Loan-loss reserves	2,600,000
Subordinated debt	5,000,000

What is its core capital? What is its total capital?

Suggested Readings

For an interesting review of usury laws in history and the changing definition of usury, read Joseph Persky's article "From Usury to Interest," *The Journal of Economic Perspectives* 21, no. 1 (Winter 2007), pp. 227–36.

The Federal Deposit Insurance Corporation (FDIC), which regulates banks and savings associations that purchase deposit insurance from it, is an exception to regulatory segmentation. Visit its site at **http://www.fdic.gov/.**

To see how competition affects the behavior of bank regulators, take a look at "Competition Among Bank Regulators," found on the Web at **http://www.richmondfed.org/publications/economic_research/economic_quarterly/pdfs/fa112002/weinberg.pdf.** In this article, John A. Weinberg analyzes how federal and state regulators compete against one another in a "race to the bottom."

For information about the Office of Thrift Supervision, visit **http://www.ots.treas.gov/.**

Chairman Ben Bernanke's speech before New York University Law School examines the costs and benefits of regulation. Using Adam Smith's "Invisible Hand" theory, Bernanke delves into a short history of the banking system, regulations, and hedge funds. His speech, titled "Financial Regulation and the Invisible Hand," can be found online at **http://www.federalreserve.gov/boarddocs/speeches/2007/20070411/default.htm.**

To see further analysis of the FDICIA's effect on bank debt, see *Does the Market Discipline Banks? New Evidence from the Regulatory Capital Mix*, by Adam B. Ashcraft. This report can be found online at **http://www.newyorkfed.org/research/staff_reports/sr244.pdf.**

For a look at the debate concerning whether banks should be regulated, see Arthur J. Rolnick's report entitled "Deposit Insurance Reform: Market Discipline as a Regulator of Bank Risk," available online at **http://www.minneapolisfed.org/Research/studies/tbtf/market.cfm?js=0.**

John C. Dugan, Comptroller of the Currency, speaks before the Committee on Financial Services of the U.S. House of Representatives about the OCC's role in securing consumer protection. Here the Comptroller discusses the different functions of the OCC and the control it has over retail banking. To see the speech from June 2007, visit **http://www.occ.treas.gov/ftp/release/2007–57b.pdf.**

Executive Vice President William L. Rutledge discusses how Basel II should improve financial stability in his speech before the International Conference on Financial Stability and Implications of Basel II in May 2005. "Basel II: Risk Management and Financial Stability" is available online at **http://www.newyorkfed.org/newsevents/speeches/2005/rut050517.html.**

The Economist gives insight into the passing of Basel II and its international impact on bank capital in this article called "All Together Now," from the July 26, 2007edition. This article can be found online at **http://economist.com/research/articlesBySubject/displaystory.cfm?subjectid=348936&story_id=9554827.**

For an analysis of the effects of deregulation on small businesses, see Yuliya Demyanyk, Charlotte Ostergaard and Bent Sorensen's article "Banking Deregulation Helps Small Business Owners Stabilize Their Income" (April 2007), available at the St. Louis Federal Reserve Web site at **http://stlouisfed.org/publications/re/2007/b/pages/deregulation.html**.

For a discussion of recommendations for financial services regulation, see the testimony of Governor Mark W. Olson on the Financial Services Regulatory Relief Act of 2003, before the Subcommittee on Financial Institutions and Consumer Credit of the Committee on Financial Services, U.S. House of Representatives, March 27, 2003. The text of Olson's testimony is available online at **http://www.federalreserve.gov/boarddocs/testimony/2003/20030327/default.htm.**

For a discussion of Basel II, see L. Jacobo Rodriguez, "International Banking Regulation—Where's the Market Discipline in Basel II?" Cato Policy Analysis No. 455 (October 15, 2002), available online at **http://www.cato.org/pubs/pas/pa-455es.html.**

For an excellent book on the material in this chapter, see Ken Spong, *Banking Regulation: Its Purposes, Implementation, and Effects*, 5th ed. (Kansas City: Federal Reserve Bank of Kansas City, 2000). Hard copies are also free for the asking from the Federal Reserve Bank of Kansas City.

For a look at "The Future of Financial Intermediation and Regulation," see the article by Stephen Cecchetti in *Current Issues in Economics and Finance*, Federal Reserve Bank of New York, 5, no. 8 (May 1999).

Ann B. Matasar and Joseph N. Heiney analyze the effects of IBBEA in "Lemonade or Lemon? Riegel-Neal and the Consolidation of American Banking," *International Advances in Economic Research* 6, no. 2 (May 2000): 249–58.

For an analysis of the success of the Community Reinvestment Act, see Robert B. Avery, Raphael W. Bostic, and Glenn B. Canner, "CRA Special Lending Programs," *Federal Reserve Bulletin* (November 2000): 711–31; also see "Does the Community Reinvestment Act Influence Lending? An Analysis of Changes in Bank Low-Income Mortgage Activity," Working Paper No. WP-00–6, Federal Reserve Bank of Chicago (May 2000).

Information on the Community Reinvestment Act (CRA) is presented in "Bank Merger Policy and the New CRA Data," by Anthony W. Cyrnak, *Federal Reserve Bulletin* (September 1998): 703–14. A related article, "New Information on Lending to Small Businesses and Small Farms: The 1996 CRA Data," also appeared in the *Federal Reserve Bulletin* (January 1998): 1–21.

Endnotes

1. For the airline industry, the regulatory agency is the Federal Aviation Administration (FAA).
2. In a world with deposit insurance, the problem is even greater because the depositors will be paid off even if the venture fails.
3. Correlation does not imply causality, which means that deregulation did not necessarily cause the subsequent insolvencies.
4. Actually, as you have seen, in a world with deposit insurance, the intermediary may consider only the costs to the stockholders and creditors because large portions of the deposits are insured. In reality, bank managers may consider only the risk of losing their own jobs if investments go sour.
5. Perhaps the only exception to this is the creation of the SAIF under the auspices of the Federal Deposit Insurance Corporation (FDIC) in 1989. However, in 2006, SAIF and BIF were combined to form the DIF.
6. In addition to the analytical factors, as noted earlier, the general "political wind" had shifted in the late 1970s toward less regulation.
7. In Chapter 4, we discussed moral hazard from a micro standpoint. In that case, borrowers had an incentive to use borrowed funds for a more risky venture once loan funds had been received.
8. This limit is rather easy for many families to circumvent. For example, a family of four can open 14 different accounts, each with $100,000 deposit insurance coverage, thus effectively giving them $1.4 million in deposit insurance at every institution. In case you are wondering how four people can have 14 accounts, it is by grouping them together in different ways. Thus, each can have an individual account; then there can be six accounts with two people on each account (such as father and mother, and mother and oldest child), three accounts with three people each, and one account with all four. Note also since 2006, retirement accounts have been insured up to $250,000, and because of the ongoing financial crisis, the limit on all accounts has been increased to $250,000 through 2009.
9. We shall see that the Interstate Branching and Banking Efficiency Act of 1994 and the Gramm-Leach-Bliley Act of 1999 also emphasized compliance with the Community Reinvestment Act.
10. In Chapter 15, we saw that the McFadden Act outlawed interstate branching and made national banks conform to the intrastate branching laws of the states in which they were located.

CHAPTER EIGHTEEN 18

Life is uncertain, eat dessert first.

—Unknown

Insurance Companies

Learning Objectives

After reading this chapter, you should know:

What life insurance, health insurance, and property and casualty companies do

How adverse selection and moral hazard create risks for insurance companies and how these are managed

The various types of life insurance policies available

Recent trends for these financial intermediaries and how they are regulated

LIFE IS UNCERTAIN

Risk Averse
A state of being wherein one is reluctant to fully bear the financial or physical loss of an event.

Two fundamental assumptions underlie how financial theorists think about financial risk and its management. First, most people are **risk averse.** We desire to reduce the likelihood that we will be subject to an unfortunate mishap and its accompanying financial loss. Second, the future is uncertain. As much as we would like to, we simply cannot foresee the future. The best we can do is to behave rationally—to make probabilistic calculations about those risks and base our behavior on playing those odds. Although this rational behavior does not insulate us from unfortunate mishaps, it does provide a starting point from which we can make logical financial decisions.

Many economic and financial theorists find it useful to distinguish between the notions of risk and uncertainty. Risk implies that an a priori calculation of an event can be probabilistically computed.[1] For instance, the odds or risk of pulling the ace of diamonds from a deck of ordinary playing cards (with jokers) is 1 in 54, or a little less than 2 percent. In contrast, uncertainty often refers to those situations with no basis for a probabilistic calculation. For instance, there is no corresponding basis on which we can make a mathematical probability calculation to infer the price of oil 20 years from now. We simply do not know how many different outcomes are possible. Instead, we resort to various types of conventions. We might presume that the world (and its prices) 20 years from now will be pretty similar to what they are today. This convention can be made slightly more complicated by building in an assumed price-level increase over the period. Alternatively, we might turn to the most distant futures prices and use them to guess about future oil prices. Note, however, the use of these conventions to make statistical inferences is a different kind of mental process than engaging in a probabilistic computation wherein the possible outcomes are known beforehand. This type of calculation lies at the heart of much of the risk management discussed in this chapter.

Risk-averse behavior can be observed in the way most people make insurance-buying decisions. When given a choice between living uninsured in a $100,000 house or paying $400 per year to insure against its loss, most of us choose to buy the insurance. It is likely that one could live in a house for an entire lifetime and never experience a major catastrophe. However, most of us also know that the loss of a house—regardless of its unlikely destruction—would be unbearable financially. Rather than taking the wager that our house will not burn down, we instead do the opposite of gambling—we purchase coverage from an insurance company. This coverage ensures that in the unlikely event of our house being burned to the ground, we will be reimbursed financially for the loss.

Chapter 4 introduced financial institutions and financial conglomerates. This chapter examines insurance companies more closely. The first section explains risk pooling and two special kinds of risk created by insurance—adverse selection and moral hazard—and examines professional employment in the insurance industry. Later sections discuss various aspects of the life, health, and property and casualty insurance businesses, how insurance companies manage adverse selection and moral hazard, and insurance industry regulation.

Insurance Company
A contractual-type financial intermediary that offers the public protection against the financial costs associated with the loss of life, health, or property in exchange for a premium.

INSURANCE COMPANIES

Overview

Insurance companies are a form of contractual-type financial intermediary that offer the public protection against the financial costs associated with the loss of life, health, or property. For a fee, called a premium, insurance companies agree to make a payment

contingent upon the occurrence of a certain event. Premiums are used to purchase financial assets until policyholders present their claims. As long as a company's combined premium revenue and investment earnings are greater than the insurance claims made against it, the company will earn a profit.

The essential principle underlying insurance is that through the pooling of risks, a loss that would be unbearable if borne by one person becomes bearable if shared with enough other people. Imagine a situation in which we can compute actuarially that, on average, three ships out of 100 leaving a particular port will sink or be captured by pirates each year. We do not know which three ships will be lost. Without insurance, the owners of the sunken and captured ships will face potential financial ruin. They may not be able to afford to stay in business. However, if the 100 ship owners band together and each pays a small premium whose sum equals the cost of replacing three ships each year, the actual loss becomes bearable. Those losing insured ships are not financially submerged but are instead able to continue their nautical pursuits. It is this basic concept that medieval merchants understood when they created the property and casualty insurance agreements to insure each other's ships. This practice continued for centuries. In the 1690s, a London coffeehouse owned by Edward Lloyd became a regular meeting place for ship owners and merchants. Before a ship set sail, its cargo was listed on a statement and read to those in the coffeehouse. Those willing to guarantee or underwrite the risk of insuring the cargo wrote their name and the share of risk they were willing to bear on the statement. Over time, Lloyd's of London grew into one of the most famous names in insurance, introducing insurance coverage for a wide variety of misfortunate occurrences.

Adverse Selection and Moral Hazard

Insurance coverage creates two additional forms of risk that must be actively managed. As explained in Chapter 15 with regard to commercial bank deposit insurance, these two additional types of risk are adverse selection and moral hazard. Adverse selection occurs when the least desirable individuals are those most likely to pursue and be selected for a transaction. Banks worry that the least creditworthy applicants are likely to pursue a loan with the most vigor. When applied to insurance, adverse selection means that those people most likely to file an insurance claim are those who will most likely apply for and be granted insurance. Continuing with our ship example, those owning the least seaworthy ships and hiring the most daring sea captains are likely to be those most interested in insuring their vessels. To prevent losses, insurance and banking firms need to actively manage this adverse selection problem.

Moral hazard is the risk that a policyholder will behave in a more risky manner than he or she would have in the absence of insurance coverage. In banking, this occurs when a borrower has an incentive to use a loan's proceeds for a venture with a higher expected return, but a riskier outcome, than stated on the loan application. In insurance, moral hazard means that the policyholder will be less careful with the insured item than he or she would be if uninsured. When faced with an impending storm, our uninsured ship owners might move their ships into a safe harbor. However, insured ship owners may be less careful in protecting their ships because they know they will receive a new ship in the case of severe damage. In the worst case, they may actually move the ship into harm's way or pay an arsonist to destroy it, hoping to profit from the damage. As with adverse selection, insurance companies must actively manage this moral hazard problem to avoid unforeseen losses. Some economists argue than even mundane items like seatbelts cause moral hazard problems. People might buckle up more often but may drive

faster and more aggressively than they would without a seatbelt, reducing the benefit of the seatbelt.

Employment

The insurance industry is a significant employer in the U.S. economy. According to the U.S. Department of Labor's Bureau of Labor Statistics, 2.3 million people worked in the insurance field in 2006 (unchanged since 1999). To develop, sell, and manage insurance policies, insurance companies hire four primary types of insurance professionals: **actuaries,** agents, underwriters, and claims adjusters. Actuaries are employed to forecast the likelihood of insurance claims being filed by insured clients. Although life, health, and property and casualty companies find it difficult to predict when any one particular person will die, or if the person will become sick or wreck his or her car, forecasts for the population as a whole are extremely accurate. By collecting and analyzing statistical data, actuaries can predict—within some margin of error—the likelihood of claimable events occurring. This information is used in the development and pricing of investment products. To sell their products, insurance companies use large numbers of licensed agents whose income is generated primarily from sales commissions. Agents can be exclusive agents, selling only the products of one particular company, or independent agents who sell policies issued by a wide number of companies. To ensure that agents do not sell policies to people who are too risky to insure, insurance companies employ underwriters who review, and then approve or reject, policy applications written by the insurance agents. Underwriters have the authority to reject applicants who fail to meet application criteria or otherwise appear unacceptably risky. Claims adjusters assist policyholders with filing claims by verifying losses and determining the insurance company's liability.

Actuaries
Insurance professionals trained in the mathematical aspects of insurance who are responsible for calculating policy premiums.

All types of insurance and insurance companies—life insurance companies, health insurance companies, and property and casualty companies—employ these types of employees. We now turn to a more detailed discussion of each of these three types of insurance companies.

Recap Risk-averse behavior in an uncertain world creates profitable opportunities for insurance companies to assist businesses and consumers with the management of risk. Insurance companies offer the public protection against the financial costs associated with the loss of life, health, or property. Unfortunately, insurance also creates adverse selection and moral hazard problems. Adverse selection exists when the least-insurable applicants pursue an insurance policy more aggressively than other applicants and, as a result, are more likely to be insured. Moral hazard is the threat that once insured, policyholders engage in riskier behavior than they would if uninsured. Actuaries, agents, underwriters, and claims adjusters play important roles in the design, sale, management, and loss determination of insurance products.

LIFE INSURANCE COMPANIES

Overview

Life insurance companies are intermediaries that offer protection against the financial costs associated with events such as death and disability in exchange for premiums. When a policyholder dies or becomes disabled, a life insurance company agrees to make either a lump sum payment or an annuity (a series of payments) to the **beneficiary** of the policy. According to the American Council of Life Insurers' Fact Book 2008, most life insurance policies and annuities in the United States are sold through one of the 1,009 U.S. life insurance companies.

Beneficiary
The person who receives an insurance payment or annuity stream after a policyholder dies.

Looking Back

The Intellectual Roots and Philosophical Applications of Risk Assessment

This use of insurance to hedge against risk has a long intellectual history and broader application. The Code of Hammurabi, a collection of laws from a famous eighteenth-century B.C.E. Babylonian king and lawyer, refers to a kind of credit insurance that predates our medieval ship insurance example by over 2,500 years. A borrower's loan was forgiven if personal circumstances made it such that he was unable to pay. The borrower, of course, had to pay an extra amount in addition to interest payments to receive this coverage. Ancient Greek and Roman societies also used burial insurance and rudimentary forms of old-age pensions. Medieval guilds provided similar protection to their members centuries later.

Insurance salesmanship has also been applied to philosophical and religious realms. Blaise Pascal, the famous seventeenth-century French philosopher and mathematician, used risk management logic in his attempt to persuade atheists to believe in God. He argued that nonbelievers might be right—God might not exist. These nonbelievers could save time and money by avoiding a lifetime of religious services, obligations, and time in prayer. However, if these nonbelievers were wrong, they faced an eternity in hell. Pascal asserted that professing a faith in God was a small "premium" to pay to avoid the unbearable loss of eternal damnation. In this light, "Pascal's wager" brings new meaning to the concept of life insurance.

Most insurers (780 of the 1,008, or 78 percent) are organized as stock companies. Stock companies issue shares of stock and are owned by their stockholders. In contrast, only 12 percent (121 companies) of life insurers are organized as mutual companies, which are owned by their policyholders (some, e.g., those classified as "fraternal," with a connection to the military or U.S. government agencies, fit in neither category). Despite a general trend for large mutual insurance companies to transform themselves to stockholder owned (to demutualize), some well-known firms retain the mutual form, such as Mutual of Omaha, New York Life, and Penn Mutual Life. John Hancock, Metropolitan Life, Mutual of New York, and Prudential are some that have demutualized in recent years. Ownership form can become complicated, with some firms partly mutual (e.g., if mutual owns stock in a publicly traded insurance company). In addition to stock and mutual insurance companies, life insurance products are also sold through a variety of fraternal societies; savings banks in Connecticut, Massachusetts, and New York; and the U.S. Department of Veterans Affairs. Exhibit 18–1 shows the top 25 life/health insurance companies ranked by their asset size.

At the start of 2008, approximately 375 million life insurance policies with a total face value of more than $19.1 trillion were in force in the United States. Some people are covered by multiple policies. The Fed's 2004 Survey of Consumer Finances shows that ownership of life insurance with cash value actually declined from 35 percent of families in 1989 to below 25 percent in 2004.

18-1
Top 25 Life/Health Insurance Groups and Unaffiliated Companies (by Total Assets, 2006, Year-End Data)

Rank	Group Name	Total Assets (in million $)
1	Metropolitan Life & Affiliated Cos	445,926
2	Prudential of America Group	368,595
3	AIG Life Group	350,283
4	Hartford Life Group	238,475
5	Manulife Finl	200,789
6	TIAA Group	186,565
7	Aegon USA Group	178,702
8	NY Life Group	178,471
9	ING USA Life Group	173,421
10	Axa Finl Group	148,682
11	Northwestern Mutual Group	145,121
12	Lincoln Finl Group	144,166
13	Principal Life Ins Co	125,532
14	MassMutual Finl Group	122,180
15	Nationwide Life Group	110,869
16	Allstate Finl	91,004
17	Pacific Life Group	87,629
18	Ameriprise Finl Group	79,109
19	Jackson Natl Group	69,407
20	Genworth Finl Group	69,049
21	Allianz Ins Group	63,647
22	Sun Life Finl Group	58,672
23	Thrivent Finl for Lutherans	52,539
24	Aflac Inc Group	50,452
25	State Farm Life Group	43,676
	Total Top 25	**3,782,959**
	Total US Life/Health & Fraternal	**4,810,562**

Source: A.M Best Co., *Best's Review*, October 2007.

Types of Coverage

Life insurance products can be divided into five main types of coverage:

1. Term life insurance (pure insurance) covers a policyholder for a specific time period or "term."
2. Permanent insurance provides coverage for one's "whole life" and embodies both an insurance component and an investment vehicle; examples include whole life, universal life, and variable life policies.
3. Annuities provide a stream of future income payments to their holder to serve as a form of protection against the risk of outliving one's income.
4. Disability insurance provides insurance coverage when workers are unable to work because of accident or illness.
5. Long-term care insurance covers the costs of services for policyholders unable to perform certain activities of daily living without assistance.

Term Life Insurance
Life insurance that provides a death benefit to an insured policyholder's beneficiary only if the insured dies within the specified period of time or "term" of the policy.

Term Life Insurance

Term life insurance is the least expensive type of life insurance. Straight term insurance provides a death benefit to an insured policyholder's beneficiary only if the insured

dies within the specified period of time, or "term," of the policy. It ends automatically after a stated number of years. Term insurance policies are often set with a fixed premium for periods of 1, 5, 10, or more years. Premiums are based on statistical data compiled in **mortality tables.** Actuaries develop and use these tables to estimate the number of people of a given age who are expected to die during a year. This information is used in conjunction with estimates of administrative costs and expected earnings on investments to establish appropriate premiums.

Mortality Tables
Schedules used to estimate the number of people of a given age who are expected to die during a year.

Term insurance policyholders know the premium and the death benefit for the term in which the policy is in force. Renewable term life insurance allows a policyholder to continue the policy for an additional term after the original policy expires. In some cases, renewal requires the policyholder to undergo a physical examination to continue insurability. Some term policies revert to one-year renewable term policies wherein premiums increase annually. In almost all cases, term policy premiums increase steeply with the age of the policyholder. Most companies do not permit renewal after a person reaches 65 or 70 years of age.

Term insurance plans are also provided by many businesses, labor unions, and professional groups to their employees or members as group life insurance. Since group coverage is cheaper to administer, often because of subsidies from the sponsoring organization, these plans are often less expensive than individual plans. Regardless of whether the term insurance is straight, renewable, or group-sponsored, it has no investment component or cash buildup. Once the term has expired, the policyholder—if living—has nothing to show for the premiums paid.

Two types of financial innovations overcome this shortcoming. First, insurance companies have developed whole, universal, and variable life policies that accumulate cash values. Second, some term insurance policies are **convertible** into these other kinds of insurance. Under specified conditions, the policyholder has the right to change his or her term life insurance policy into a whole, universal, or variable life product. This may often be done without providing evidence of insurability if it is changed within some given period stated by the policy.

Convertible
Insurance policies containing a clause allowing the policyholder to change a term insurance policy into a permanent (whole, universal, variable) life insurance product.

Permanent Life Insurance

Like term life insurance, **whole life insurance** (sometimes called a straight life policy or continuous premium policy) charges a fixed premium and pays a fixed death benefit as long as the policyholder makes timely premium payments. However, whole life policies differ from term insurance in two fundamental respects. First, whole life policies are not limited to a particular term. Instead, they are a form of permanent life insurance that provides protection for as long as the insured lives and makes premium payments. Second, the premiums for whole life insurance are substantially higher than those for term life insurance, especially at the beginning of the contract. These additional premium amounts accumulate in a separate account as a cash reserve that is invested by the insurance company for the policyholder's benefit.

Whole Life Insurance
A permanent type of life insurance that charges a fixed premium and pays a fixed death benefit, and whose separate account is invested by the insurance company for the policyholder's benefit.

There are two main tax advantages of accumulating a cash reserve in this way. First, under current tax law, cash reserves accumulated within an insurance policy grow tax deferred—no tax is paid unless the funds are withdrawn. However, tax law does require that the cash value of a policy cannot exceed its death benefit. Second, death benefits usually pass to beneficiaries free of taxation. In addition to these benefits, cash reserves can be borrowed by the policyholder at low interest rates, used to make premium payments, or taken as a cash surrender (turn-in) value. If the policy is canceled, the policyholder is entitled to this cash surrender value minus any outstanding loans against the policy. In the case of death, the beneficiary receives only the policy's face value, regardless of the cash value of the separate account.

In the high-interest-rate environment of the late 1970s and early 1980s, whole life insurance policyholders found that the growth in the cash reserve portion of their policies failed to keep up with the rate of inflation or even the rates of return on conservative money market instruments. In response, many policyholders allowed their policies to lapse. They began instead to follow the financial planning advice of the day, which said, "buy term and invest the difference" to reap higher rates of return than could be earned with traditional whole life policies.

To attract customers in this more volatile interest rate climate, insurance companies created **universal life insurance** in 1979. This product maintains a similar pure life insurance product, but allows the interest rate on cash reserves to adjust with market interest rates. Policyholders effectively pay a premium that covers the cost of term insurance and funds a separate account as well. The separate account grows at a fluctuating interest rate similar to that received on money market accounts or short-term CDs. Policyholders are also allowed to vary the amount of their premium as long as they meet the minimum amount needed to fund the pure insurance part of their policy.

Universal Life Insurance
A form of permanent life insurance that provides a pure insurance product as well as a separate account. This separate account grows at a fluctuating rate of interest similar to that received on a money market account or short-term CD. Premium payment amounts may be flexible as long as the minimum premium for the pure insurance benefit is met.

A more recent variation on this theme is the creation of **variable life insurance,** or equity-linked policies. (These policies are sometimes referred to as universal variable life insurance.) Like regular universal life policies, variable life policies have an insurance component and a separate account. The fundamental innovation is that variable life insurance policies allow policyholders to more actively manage their separate account and use it to purchase mutual fund shares from an array of insurance company–approved funds. This policy innovation allows for the possibility of even greater returns than those possible with universal life and allows policyholders to take advantage of tax-deferred growth. Like universal life, the combination of premium payments and/or policy cash values must be sufficient to pay the pure cost of the insurance to maintain the policy. As long as sufficient premiums are paid or adequate cash reserves in the policy pay the cost of insurance, a minimum death benefit is guaranteed. Exhibit 18–2 summarizes the differences in life insurance products.

Variable Life Insurance
A form of permanent life insurance that provides a pure insurance product as well as a separate account. The separate account may be used by the policyholder to purchase mutual funds from a list of insurance company–approved funds. These equity-linked funds pay a minimum death benefit as long as sufficient premium payments are received.

Universal and variable life insurance products help insurance companies compete against other kinds of financial products. They also help insurance companies manage risk. By allowing the funds in separate accounts to adjust with market interest rates—like those in universal life insurance policies—or to be managed by policyholders in various kinds of mutual funds within variable life insurance policies, insurance companies no longer need to guarantee a particular rate of return. In short, universal and variable life insurance products shift the risk of inadequate account appreciation from insurance companies to policyholders. If interest rates or mutual fund valuations change such that policyholders receive low returns, it is not the insurance company that loses.

18-2
A Comparison of Term, Whole, Universal, and Variable Life Insurance Products

	Term	Whole	Universal	Variable
Pure insurance coverage	Yes	Yes	Yes	Yes
Permanent protection (not limited to a particular term)	No	Yes	Yes	Yes
Cash reserves accumulate	No	Yes	Yes	Yes
Cash reserves accumulate at money market rates of interest	NA	No	Yes	No
Cash reserves accumulate at rates tied to mutual fund performance	NA	No	No	Yes

Rather, policyholders suffer the loss and end up with a lower death benefit or higher premium costs than they had expected.

Term life and permanent life insurance products insure against the risk of death. Products that insure against the risk of living longer than expected are also available, and include annuities, disability insurance, and long-term care insurance.

Annuities

Imagine a retiree who lives longer than she expects and spends down all of her retirement funds. She spends herself into poverty and is forced to rely on her family, Social Security, Medicare, and/or Medicaid to manage her remaining years of retirement. (Medicaid is a joint federal-state program that funds long-term care for low-income people once they have spent down most of their assets. Medicare is the federal program that pays for medically related recovery and rehabilitation services for those above a qualifying age.) Our retiree could have avoided this outcome if she had foreseen this difficulty early enough and had the funds available to purchase an annuity. An **annuity** is a contract that promises either (1) periodic payments over the lifetime of the **annuitant** (owner of the annuity), or (2) periodic payments for a specified period of time.

Annuity
An insurance contract that provides a periodic income at regular intervals for a specified amount of time, such as a number of years or for the life of the beneficiary.

Annuitant
The owner of an annuity.

Some policies guarantee the refund of all money contributed by the annuitant minus a fee for administrative costs. In this case, if the annuitant dies before receiving all of the proceeds of the annuity, the cash value is passed to the beneficiary. Annuities can be characterized as either immediate or deferred. Immediate annuities begin to pay income at once; deferred annuities increase in value before payments begin at some time in the future.

Disability Insurance

According to the American Council of Life Insurance (ACLI), "nearly one-third of all Americans will suffer a serious disability between ages 35 and 65." Many of these illnesses or accidents result in prolonged periods of unemployment and the concomitant loss of income. To address this problem, life insurance companies offer **disability insurance.** These policies provide a portion (commonly 50–70 percent) of an insured worker's previous income while the worker is unemployed. Since the latter half of the 1990s, disability income products have become more customized, with a variety of different benefit levels and definitions of what qualifies as a claimable disability. Most disability policies are sold through group plans.

Disability Insurance
Policies, exchanged for premiums that are designed to cover a portion of an insured worker's previous income if the worker becomes unable to work because of illness or injury.

Long-Term Care Insurance

As the American population ages, there is a growing need for services to help those unable to carry out the daily tasks of bathing, eating, dressing, and moving about without assistance. **Long-term care insurance** was developed to help fund the provision of these services. The U.S. government currently pays for more than half of long-term care expenditures through Medicaid and Medicare. Increasingly, insurance companies are making policies available for skilled nursing home care and for services that allow the insured to stay at home and benefit from assisted living and home care medical services.

Long-Term Care Insurance
Private insurance, purchased typically before assistance is required, by individual payment of premiums. It covers care received either at home or in a facility for someone needing assistance with activities of daily living (bathing, dressing, toileting, transferring, continence and eating), or suffering severe cognitive impairment (such as Alzheimer's disease). Long-term care insurance is not intended to improve or correct medical problems.

Recent Trends and Balance Sheet Composition

The Financial Services Modernization Act of 1999 (Gramm-Leach-Bliley Act) allows for a fundamental change in the way in which insurance companies compete. The act removed the last vestiges of the Glass-Steagall Act provisions that prohibited commercial banks, security firms, and insurance companies from joining forces. The first firm to test the waters—actually one year before the act passed—was Citibank in its merger

with Traveler's Insurance Group, which created Citigroup. Insurance companies that are not owned by banks or that have not purchased banking affiliates will likely find themselves at a competitive disadvantage as combined organizations market their products to customers throughout the combined firm. Reflecting the blurring lines between insurance and banking, this combination of banking and insurance is known as bancassurance.

Insurance companies and their agents have been moving away from an almost exclusive focus on insurance products to a broader focus on overall financial planning services. This new approach relies on providing clients with financial planning advice and access to mutual funds, stocks, bonds, and money market instruments.

As we saw in Chapter 4, life insurance company balance sheets hold a large share of corporate stocks and bonds. As of mid-year 2006, life insurance company assets consisted of 51 percent government, corporate, and foreign bonds, 31.7 percent stocks, 6.5 percent mortgages. This high degree of long-term asset holdings can be explained by the relatively predictable payments that insurance companies can be expected to make. The reserves set aside to fund policy benefits in the future make up the vast majority of insurance company liabilities.

Recap

Life insurance companies offer protection against the financial costs associated with death and disability in return for premiums. The five main types of coverage include term life insurance, permanent life insurance (whole, universal, and variable), annuities, disability insurance, and long-term care insurance. Since the payments made by life insurance companies are relatively predictable, they are able to hold a large share of bonds and stocks on their balance sheets. The Financial Services Modernization Act of 1999 allows insurance companies to merge with banks and securities firms. This deregulation of the financial services industry allows financial conglomerates to market and sell insurance products alongside other banking and investment services.

HEALTH INSURANCE COMPANIES

Health Insurance Companies
Intermediaries that offer protection, in exchange for premiums, against the financial costs associated with events such as doctor visits, hospital stays, and prescription drugs.

Health insurance companies are a second kind of contractual-type intermediary. In return for premiums, health insurance companies pay part or all of the costs of hospitalization, surgery, doctor's visits, laboratory tests, prescription drugs, and other medical expenses. The provision of health insurance has been a contentious political issue since President Bill Clinton proposed fundamental reform of the health insurance industry in 1992. At that time, 34 million Americans were uninsured, the costs of health care and health insurance were escalating, and the share of U.S. GDP spent on health care expenditures was growing.

Between 1992 and 2008, the number of uninsured Americans nearly doubled to 46 million (including 9 million children). Costs continued to increase—albeit at a slower rate—and the share of GDP spent on health care remained high, with this measure nearly double that of some other developed countries with universal health insurance coverage (e.g., Japan). Higher medical costs were putting a strain on the government programs (Medicaid and Medicare) used to provide health insurance coverage for the indigent and the elderly. Although fundamental reforms have not been passed, the media's attention to rising costs and to the millions of uninsured Americans has forced many to take notice.

The rising cost of health care has also put a strain on the many company-sponsored health insurance plans. As costs rose, companies have dealt with rising premium costs by curtailing coverage, asking employees to bear a bigger share of the burden, and at-

tempting to control costs. To control costs directly, firms have negotiated with physicians' groups to provide particular medical services at a set fee. They have also created managed care plans that require patients to have medical services approved before any nonemergency medical procedure is completed.

Health Maintenance Organizations (HMOs)
Specialized health care insurers that provide almost complete medical care in exchange for fixed per-person premiums.

Many insurance companies have created **health maintenance organizations** (HMOs) to assist with the controlling of medical costs. HMOs provide almost complete health care services in return for a fixed, per-person premium. In return, most medical expenses are paid subject to a deductible and copayment by the insured. Three primary problems have arisen from HMO arrangements. First, health care costs have continued to increase and HMOs have frequently underestimated these costs. This has caused HMOs to experience financial losses and has led many insurance companies to sell their HMO affiliates. Second, HMO providers have an incentive to limit medical services to cut costs. This has led to criticisms that bureaucrats—not doctors—are making decisions about which medical procedures are most appropriate. Third, medical services must usually be provided by a medical staff designated by the HMO. Consumers have chafed at this mandate and at laws prohibiting them from suing their HMOs for providing substandard medical services. These complaints have led to calls for a Patient's Bill of Rights that would enhance consumer choice and hold HMOs financially liable for their actions. Despite these problems and the clamor for reform, American membership in HMOs increased from about 3.5 million in 1970 to over 75 million by 2008.

In late 2009, the Obama administration was grappling with many health care reform proposals that would bring the United States closer to some form of universal health coverage.

Whether or not a health care reform package is passed in 2009, it does seem that some form of reform is inevitable in the next few years, because the current system is not sustainable due to rising costs.

PROPERTY AND CASUALTY COMPANIES

Property and Casualty Companies
Intermediaries that provide protection against the effects of unexpected occurrences on property.

Property and casualty companies are the third form of contractual insurance intermediary.

Property Insurance
Contingent claims, exchange for premiums that protect insured policyholders from the financial costs of property loss, damage, or destruction.

Property insurance protects insured property owners (or renters) against the effects of property loss, damage, or destruction caused by various natural perils such as fire, storm, or acts of God;[2] or human perils such as automobile accidents, theft, vandalism, arson, or burglary. Property insurance is most frequently used to protect automobile owners and homeowners. Businesses use property insurance to protect commercial property and the accompanying loss of income caused by its damage or loss.

Casualty (Liability) Insurance
Insurance exchanged for premiums that protects insured policyholders from the financial responsibilities to those harmed by an accident, product failure, or professional malpractice.

Casualty (liability) insurance protects a policyholder from financial responsibility to those harmed by an accident, product failure, or professional malpractice. It also provides coverage to commercial and individual property owners when a person is injured on the property. Manufacturing companies purchase casualty insurance to protect themselves against product defects that cause injury or death to consumers. Doctors, lawyers, and other professionals purchase liability insurance to protect themselves from claims of negligence or malpractice. While property insurance lends itself to the actuarial calculations of risk, liability risk exposure is more uncertain and is virtually impossible to predict accurately. The liability suits and high putative damage awards successfully brought against tobacco companies in the late 1990s and in the early 2000s were unimaginable to most only 10 years earlier.

Most automobile insurance policies are a combination of both property insurance and casualty insurance. The property insurance portion protects against loss or damage to the vehicle in case of an accident, vandalism, damaging weather, or theft. The casualty

insurance portion of the policy provides the owner with liability coverage if he or she harms another or another's property with the vehicle. Assume a two-car accident. Your car hits another car and causes injuries both to yourself and to the other driver. You, the insured driver, are at fault, so the property insurance part of your policy will pay for the repair of your car. The casualty part of your insurance policy will pay for any medical injuries to yourself and for the repair of the automobile you hit. It will also cover the medical bills (up to some prescribed limit) of the other driver. If the case had to first go through court, the liability insurance would also, in some cases, cover the defendant's court costs. In some states, **no-fault insurance** coverage enables insured auto accident victims to collect damages from their own insurance company regardless of whether or not they caused the accident.

No-Fault Insurance
Insurance coverage that pays an accident victim regardless of who caused an accident or damage.

Exhibit 18–3 lists the 25 largest property and casualty insurance companies in rank order. Although there are currently more than 3,000 property and casualty companies in the United States, the top 25 hold 970 billion dollars in assets, representing over 65 percent of the $1.49 trillion in total assets held. Referring back to Exhibit 18–1, we see that total assets held by Life and Health Insurance companies are over three times as large, at $4.8 trillion in total assets, with the top 25 firms holding assets worth over 80 percent of this total ($3.78 trillion). This comparison illustrates a basic fact: life insurance companies tend to be much larger than property and casualty insurers.

18-3

Top 25 Property/Casualty Insurance Groups and Unaffiliated Companies (by Total Assets, 2006, Year-End Data)

Rank	Group Name	Total Assets (in mil $)
1	Berkshire Hathaway Ins	121,932
2	State Farm Group	120,242
3	Amer Intl Group, Inc	114,633
4	Travelers Ins Cos	75,023
5	Allstate Ins Group	50,038
6	Liberty Mutual Ins Cos	47,845
7	CNAInsCos	41,277
8	Hartford Ins Group	40,319
9	Nationwide Group	38,453
10	Chubb Group of Ins Cos	36,130
11	Zurich Financial Svcs NA Group	33,089
12	Swiss Reins Group	31,881
13	Farmers Ins Group	23,724
14	State Comp Ins Fund CA	23,140
15	USAA Group	20,552
16	Ace IN A Group	20,363
17	Progressive Ins Group	17,871
18	Munich Re America Corp. Group	17,688
19	State Ins Fund of NY	15,224
20	Allianz of America, Inc	14,470
21	Fairfax Financial (USA) Group	14,112
22	W.R. Berkley Group	13,760
23	Safeco Ins Cos	12,655
24	Auto-Owners Ins Group	11,368
25	Amer Family Ins Group	11,201
	Total Top 25 P/C Writers	**967,248**
	Total U.S. P/C Industry	**1,488,000**

Source: A.M Best Co., *Best's Review,* October 2007.

Alleged Racial Bias in Property and Casualty Insurance and Life Insurance

During the late 1990s, property and casualty insurance companies faced allegations of racial bias in their treatment of minority applicants and others living in minority neighborhoods. This allegation was forcefully made by various authors in Gregory D. Squires's compiled volume, *Insurance Redlining: Disinvestment, Reinvestment, and the Evolving Role of Financial Institutions* (Washington, DC: The Urban Institute Press, 1997). The book documents that residents of minority neighborhoods have to travel farther to find an insurance agent's office, are less likely to have agents return their phone calls, are denied coverage more often than nonminorities, are offered less comprehensive insurance coverage, are charged higher premiums, and have their insurance claims processed more slowly. Because of these actions and policies, blacks and other people of color, as well as those living in minority neighborhoods, experience unequal access to housing, mortgage finance, home improvement loans, and business loans. The authors collectively and persuasively demonstrate that the insurance industry has created institutional barriers that unfairly hinder people of color and others living in minority neighborhoods in accumulating financial wealth. These barriers to wealth accumulation perpetuate inequality and produce poverty within the inner city. The authors claim that the government's response to these grievances has been haphazard and incomplete because the industry lacks a federal regulatory agency.

Life insurance companies also face allegations of racial bias for practices such as using race as a basis for charging higher premiums. *U.S. News & World Report* published the story of Bessie Smith, who paid more than $1,600 for a burial policy worth $1,000. The price was obviously unfair and caused even more hurt to Ms. Smith when she learned that white policyholders were charged less for the same policy. She was not alone. In June of 2000, Smith and millions of other minority policyholders settled charges of racial discrimination with American General Life and Accident Insurance Company for $215 million. The words of American General's chairman and CEO Richard Devlin are hard to improve upon as a statement of prudent insurance company management: "It was imperative that we move swiftly and responsibly to correct an unfortunate historical practice."

Other life insurance companies also face allegations of racial discrimination. According to Scot J. Paltrow of the *Wall Street Journal,* lawyers representing millions of African-American policyholders sued Prudential Insurance Co. of America and MetLife Inc. in July 2000. The plaintiffs sought damages on past life insurance sales for an alleged "nationwide scheme of racial discrimination." Prudential even admitted that, "like many other insurance companies, Prudential, at certain points in its history, used race-based underwriting." However, the company went on to argue that it had stopped this practice "many years ago." The suits facing these two companies contend that in the past, policies carrying lower benefits and higher premiums had been specifically marketed to blacks. The key issue is the allegation that although the companies stopped selling these policies, they did not do enough to make up for past discrimination as

they failed to increase the benefits owed to African-American policyholders or to refund their excess premium payments.[a]

Endnote

a. Angie Cannon, "Paying for a Bad Policy," *U.S. News and World Report,* vol. 129, July 3, 2000, p. 24; Scott Paltrow, "Prudential Insurance, MetLife Face Suits over Alleged Racist Practices," *Wall Street Journal,* July 13, 2000; Reynold Nesiba, "Review for *Insurance Redlining: Disinvestment, Reinvestment, and the Evolving Role of Financial Institutions,* edited by Gregory Squires," *Journal of Economic Issues* 32:3 (September 1998) :901–904.

The composite balance sheets of life insurance companies and property and casualty companies differ not only in asset size but also in asset composition. As of March 2008, life insurance companies held about 80 percent of their assets in the form of corporate and foreign bonds and corporate equities. In contrast, property and casualty companies held only about 37 percent of their assets in this form. This is because life insurance companies sell longer-term policies with more predictable payments and with more clearly defined loss exposure. In contrast, the total losses on property and casualty claims, especially liability claims, are more difficult to predict. Similarly, many property and casualty policies are for short periods of time and are more prone to the problems of adverse selection and moral hazard than are typical life insurance products.

Recap Health insurance companies offer contingency claims in return for health insurance premiums. Recent increases in health care costs have led to new ways to manage care and control costs. Property and casualty companies offer policies that are complementary for both individuals and businesses. Property insurance offers financial protection against the effects of property loss, damage, or destruction caused by fire, theft, storm, or acts of God. Casualty insurance protects the insured from financial claims of others who are harmed by an accident, product failure, or professional malpractice.

MANAGING ADVERSE SELECTION AND MORAL HAZARD IN THE INSURANCE INDUSTRY

All insurance companies must actively manage their clients to prevent adverse selection and moral hazard problems. Remember, adverse selection suggests that those entering the insurance pool are more likely than the population as a whole to file a claim. Those needing insurance have an incentive to pursue its acquisition most aggressively. Moral hazard suggests that once people get into the pool, their behavior will be altered and they will behave in a more reckless manner than they would be if they were uninsured. Insurance coverage tends to attract higher-risk clients and tends to make insured policyholders behave in a more reckless manner than they would otherwise. Insurance companies have created a variety of management practices to address these problems, as summarized in Exhibit 18–4.

The first line of defense is for insurance underwriters to screen out those applicants who would be poor insurance risks. Life insurance companies routinely refuse coverage to those in poor health or past a certain age. Property and casualty companies

18-4 Top Ten Ways to Manage Adverse Selection, Moral Hazard, and Other Risks in the Insurance Industry

1. Effective screening
2. Riske-based premiums
3. Deductibles
4. Coinsurance
5. Threaten or cancel coverage
6. Restrictive provisions
7. Fraud prevention
8. Limit the amount of insurance
9. Reinsurance
10. Effective credit, interest rate, liquidity, and exchange rate risk management

check driving records before agreeing to provide automobile coverage. A driver with a history of frequent accidents is likely to be denied coverage. Until prevented by federal regulation, health insurance coverage routinely denied coverage to patients with "pre-existing conditions" that would increase the likelihood of costly medical care.

Risk-Based Premiums
Insurance charges that increase with the perceived risk of the policyholder.

A second line of defense is to charge substantially higher **risk-based premiums** instead of denying coverage. The elderly can obtain life insurance, poor drivers can get automobile coverage, and the chronically ill can buy health care coverage. However, they will be charged higher premiums to compensate for the higher expected payouts they will generate from the insurer.

A third defense, used primarily to prevent moral hazard in almost all health and property insurance policies, is to require insured policyholders who file claims to pay deductibles. A **deductible** is the fixed amount an insured person must pay when a claim is paid off. Automobile coverage, for instance, may require the insured to pay the first $250 of a $2,000 hail damage claim. This has two effects: First, since insured policyholders stand to lose in the wake of a damage claim, they have an incentive to get the car into the garage if a menacing storm is approaching. Second, since policyholders are forced to bear the costs of low-dollar-amount claims, insurance companies avoid handling the paperwork associated with frequent small claims.

Deductible
A fixed amount that the insured policyholder is required to pay before insurance coverage becomes effective.

Coinsurance (requiring a copayment) serves as a fourth line of defense against moral hazard. By requiring the insured to pay 20 percent of a medical bill while the insurance company pays the other 80 percent, a financial incentive effect similar to a deductible is imposed. The policyholder has an incentive to avoid needless medical care. Many prescription drug policies use a similar arrangement by requiring a $5 to $20 copayment when a policyholder purchases prescription medication.

Coinsurance
The percentage share or fixed amount of a claim that must be paid by the policyholder. Many health insurance companies require 80/20 cost sharing, with the insurer bearing 80 percent of the cost and the policyholder paying 20 percent. The policyholder's share is sometimes capped at some maximum out-of-pocket expense.

A fifth tool companies can use to reduce unnecessarily risky action by their policyholders is to threaten cancellation of their insurance coverage. An automobile insurer can warn a policyholder with frequent accident claims that further claims will result in the cancellation of coverage. Of course, management by idle threat is likely to be ineffective. If policyholders continue to cost more than they are worth, companies do cancel policies.

Restrictive provisions stand as a sixth management tool to reduce insurance company exposure to risk. Some life insurance companies refuse to pay claims if the insured commits suicide. Similarly, some health insurance companies restrict coverage of medical liability claims for injuries sustained from parachuting or skydiving. Some property and casualty companies deny liability coverage for injuries sustained while jumping on a trampoline.

For restrictive provisions to be effective, insurance companies use a seventh tool—fraud prevention. Insured policyholders have an incentive to file fake claims or to make claims on injuries sustained while engaging in restrictive activities. A homeowner

Looking Back

2001 Terrorist Attacks and 2005 Natural Disaster Cause Record Insurance Losses

The September 11, 2001, terrorist attacks on the World Trade Center (WTC) and the Pentagon resulted in enormous human loss, retaliatory military strikes, and an economic contraction for the United States. Insurance losses were the largest in world history up to that point. Robert Looney at the Naval Postgraduate School[a] reports that losses for the insurance industry (including reinsurance) were between $30 and $58 billion, with the main uncertainty concerning liability insurance. Previously, the most costly disaster had been Hurricane Andrew in 1992 with a total cost of about $21 billion.

Following the attacks, most primary insurers increased their premiums and curtailed or dropped altogether coverage for terrorism-related risk. Increases in insurance premiums adversely affected several key industries (e.g., aviation, transportation, construction, tourism, and energy generation). Gail Makinen reports that commercial property and liability insurance rates rose by an estimated 30 percent on average[b]. Losses included business interruption ($11.0 billion), property ($9.6 billion), liability ($7.5 billion), workers' compensation ($1.8 billion), and others ($2.5 billion). Companies with the largest financial exposure were reinsurers, such as Munich Re, Swiss Re, Berkshire Hathaway, and Lloyd's of London.

The 2001 terrorist attacks were not to hold the record for most costly disaster for long. On August 29, 2005, Hurricane Katrina made landfall on the Gulf Coast with high-velocity winds and a 30-foot storm surge accompanied by heavy rainfall. Coastal towns and cities were flooded, with parts of Mississippi completely devastated and no buildings left standing in some towns. New Orleans was devastated. Catastrophe-insured losses in 2005 totaled $66.1 billion from 24 disasters, with insured losses from Katrina alone estimated to be $43.6 billion, stemming from 1.75 million claims. Despite the severity of storm damage, Hurricane Katrina and other catastrophes in 2005 did not threaten the solvency and claims-paying ability of the property and casualty insurance industry. In fact, partly due to favorable market conditions over the period, insurers experienced record profits from 2004 to 2006. In the aftermath of Katrina, concerns about the potential vulnerability of the insurance industry to a future mega-catastrophic event have arisen. Policy makers need to consider what role the federal government should play in financing catastrophe risks.

Endnotes

a. Robert Looney, "Economic Costs to the United States Stemming From the 9/11 Attacks," *Strategic Insights* 1:6 (August 2002), available at www.ccc.nps.navy.mil/si/aug02/homeland.asp.

b. Gail Makinen, "The Economic Effects of 9/11: A Retrospective Assessment" (September 27, 2002) (Washington, DC: Congressional Research Service, p. CRS-4), online at: www.fas.org/irp/crs/RL31617.pdf.

whose house has been completely destroyed may be tempted to claim the loss of assets that she never owned. To prevent this, insurance companies require documentation that the homeowner actually possessed the item. Many homeowners periodically videotape the contents of their house with a camcorder to create this documentation.

An eighth management tool is to limit insurance coverage to the value of the insured property. If a homeowner could insure his $100,000 house for $200,000, he could be tempted to torch the house in hopes of reaping a $100,000 gain. Limiting insurance to the value of a property or less helps eliminate this moral hazard.

Reinsurance
The practice by smaller insurance companies of sharing the risk of a large policy with other insurance companies to reduce risk exposure.

A ninth way to manage insurance company risk is to engage in **reinsurance,** which involves sharing the risk of a policy with other insurance companies. A small insurance company may write a large property and casualty policy to a large corporation. Rather than face the possibility of paying a large claim alone, the small insurance company may allocate a portion of the risk to other companies for a share of a portion of the premiums. In this way, total exposure is reduced, as well as any adverse selection or moral hazard problems that accompany it.

A tenth and final way for insurance companies to manage risk really has nothing to do with adverse selection and moral hazard. Instead, it is a reminder to be vigilant in the management of the credit, interest rate, liquidity, and exchange rate risks faced by all financial institutions. The bonds, stocks, and real estate held on insurance company balance sheets are subject to credit or default risk and market fluctuations. Care must be taken to diversify portfolios. Insurance companies have become insolvent because of losses on junk bonds and real estate holdings. Similarly, insurance companies—particularly life insurance companies—are subject to interest rate risk because of their holdings of long-term securities. As interest rates increase, the value of these long-term securities falls. This can be managed with increased use of floating rate securities and prudent use of futures contracts and interest rate swaps. Liquidity risk is particularly problematic for property and casualty companies that are subject to a large number of simultaneous claims due to a natural disaster. This can be reduced by geographically diversifying where policies are sold and by maintaining an adequate level of liquid assets. Exchange rate risk plays a small but growing role as insurers become more international in scope. Diversification of asset holdings and avoiding large foreign currency–denominated assets and policies are effective ways of reducing this risk.

REGULATION

Despite the active management of risk by insurance companies, government agencies have also been created to provide outside supervision of the industry. Unlike the depository institutions examined in earlier chapters, life, health, and property casualty insurance companies are regulated almost exclusively by state-level insurance commissioners. It did not always appear that it would work out this way. In 1944, the Supreme Court ruled that insurance was subject to federal regulation because it involved interstate commerce. However, Congress lost little time in writing the **McCarran-Ferguson Act of 1945,** which exempts the insurance industry from federal regulation. The agencies that serve as federal regulators are the Internal Revenue Service (IRS), which administers special taxation rules, and the Securities and Exchange Commission (SEC), which requires insurance companies with publicly traded stock to comply with its requirements.

McCarran-Ferguson Act
Federal statute passed in 1945 that exempts life insurance companies from federal regulation and defers their oversight to state insurance commissioners in each state.

In addition, each state establishes its own set of safety and soundness regulations with regard to the types of securities insurance companies may hold, the levels of capital required, and the accounting standards adopted. Insurance companies are compelled to follow the standards set by the state in which they are chartered, as well as the regulations

The American International Group (AIG) Bailout

The American International Group (AIG) is a giant financial firm best known for its insurance, annuities, and mutual funds. The firm seemed to be headed toward bankruptcy before being bailed out by the U.S. Treasury and the Federal Reserve in late 2008. AIG's troubles came not from its "bread-and-butter" insurance or retirement products but rather from its deep involvement in insuring financial risk. Just as individuals would like to buy insurance to protect against a fire destroying their homes, firms lending money would like protection against the possibility that the borrower will default. By selling products like credit default swaps, AIG provided such types of insurance on a huge scale to a wide variety of customers. AIG then lost billons of dollars when assets such as residential mortgages dropped in value in 2007 and 2008 and firms that had invested in them appeared likely to default on loans insured by AIG.

Just as selling fire insurance is very profitable so long as there is no fire, selling insurance against financial risk was very profitable for AIG so long as financial risk was declining. Insurance companies offering fire insurance in one area typically share the business and spread risk by organizing a group or syndicate of insurance companies. They also invest customers' premiums in assets that can be sold, or "liquidated," in the event of a fire, which would require payment of victims' claims.

Valuing the potential loss in the event of a bad outcome, and so the amount that an insurer must keep in liquid assets, is difficult even for traditional types of insurance. It is even more subjective for new types of insurance against bad outcomes involving new and complex financial instruments. AIG's methods of accounting for such risk had come under suspicion, and were part of the reason for the removal of its CEO, Maurice R. "Hank" Greenberg in 2005, who had been in charge of AIG since 1968.

AIG offered protection against default risk of financial firms like Lehman Brothers, which held risky assets, such as subprime-backed "toxic" mortgage loans. The subprime mortgage meltdown of 2007 evolved into the financial crisis of 2008; this was the "bad outcome" against which AIG had provided insurance. The fact that many financial firms that had purchased protection from AIG were themselves in financial difficulty implied that AIG's problems could adversely impact the entire financial system.

On September 16, 2008, the Federal Reserve agreed to loan AIG up to $85 billion, secured by the assets of AIG subsidiaries, in exchange for nearly 80 percent of the equity in the company. As events unfolded, it became clear more money would be needed. The Fed loaned AIG an additional $37.8 billion on October 9, 2008. Then on November 10, the U.S. Treasury announced the purchase of $40 billion of new AIG preferred stock (using some of the $700 billion bailout funds approved by Congress). Subsequently, the Fed modified its original loan from $85 billion to $60 billion, extended the life of the loan from three to five years, and lowered the interest it charged AIG.

The traditional insurance and retirement products offered by firms owned by AIG were apparently never at risk. Subsidiaries such as AIG American General, AIG Direct, and 21st Century Insurance were regulated by state insurance authorities and forced to hold sufficient reserves.

The new CEO installed after the bailout stated that the U.S. government was making a "very, very smart investment." Time will tell if this was true.

Sources

"Cheque mate," *The Economist,* November 13, 2008.
"U.S. to Take over AIG in $85 Billion Bailout," Wall Street Journal, September 16, 2008.

in any state in which they do business. To help manage the crazy quilt of 50 possible regulatory approaches, the National Association of Insurance Commissioners (NAIC) develops model laws and regulations. These models are often used by state legislatures when revising or writing new legislation. Since the state of New York comprises a large life insurance market and is the headquarters for many insurance companies, its laws and regulations have a widespread impact on the industry. To ensure that agents are familiar with the products they sell to consumers, all states require that agents be licensed in each state in which they sell insurance.

EVOLUTION AND GLOBALIZATION

The insurance industry caters to the risk-averse desires of individuals and businesses by pooling risks and allowing policyholders to purchase appropriate protection for life, health, and property and casualty needs. Although the fundamental benefit of risk pooling has remained unchanged for centuries, the insurance industry continues to evolve and to expand globally. As we have seen with other financial service providers, financial modernization and the desire to remain competitive have encouraged insurers to combine with banks and securities firms to provide a wide range of savings, investing, payment, and financial planning services. Some insurance companies, or their holding companies, moved beyond traditional risks into insuring financial risk (see "A Closer Look" regarding AIG).

Recent lawsuits and the pursuit of profit have forced insurance companies to change the way they do business with minority individuals and in minority neighborhoods. The volatile interest rates of a few decades ago served as an impetus for the development of new universal and variable life insurance products. These products better meet the needs of consumers and allow insurers to better manage their own risk exposure. The life insurance industry has become more global in nature, with the fastest growth occurring in developing countries where income growth is the most rapid.

Recap Since insurance creates the dual problems of adverse selection and moral hazard, it must be actively managed. This can be done through careful screening, risk-based premiums, deductibles, coinsurance, threatening policy cancellation, restrictive provisions, fraud protection, limiting insurance coverage, engaging in reinsurance, and managing other risks. Because of the McCarran-Ferguson Act of 1945, insurance companies are primarily regulated at the state level. Despite this, the insurance industry has continued to expand globally.

In the next chapter, we look at pension funds.

Summary of Major Points

1. Many economists and financial experts find it useful to distinguish between risk and uncertainty. Risk refers to those situations wherein one can calculate the odds of a particular outcome. It requires a priori knowledge of all possible outcomes and some data on which rational decision making can be based. In contrast, uncertainty refers to situations in which there is no basis for a probabilistic computation. These arise when a decision maker lacks knowledge regarding possible outcomes on which to compute a mathematical probability.
2. Risk aversion refers to the desire of financial decision makers to reduce the likelihood of an unfortunate mishap and its accompanying financial loss. In an uncertain world, risk-averse behavior creates profitable opportunities for insurance companies and pension plans to help others manage risk.
3. Insurance companies are a form of contractual-type financial intermediary. The financial costs associated with the loss of life, health, or property can be reduced by buying insurance from life, health, and property and casualty companies, respectively. For a premium, insurance companies agree to make a payment contingent upon a certain event occurring. The design, sale, management, and loss determination of insurance policies are carried out, respectively, by actuaries, agents, underwriters, and claims adjusters.
4. The use of insurance by policyholders creates the dual challenges of adverse selection and moral hazard that must be actively managed by insurance companies. Adverse selection occurs when the riskiest or least-profitable policy applicants pursue an insurance policy more vigorously than other applicants and are therefore more likely to become insured. Moral hazard refers to the possibility that an insured policyholder's behavior will be riskier than it was in the absence of insurance.
5. The financial costs of unexpected events such as death and disability can be managed by purchasing life or disability insurance. Types of life insurance coverage include term life insurance, permanent life insurance (whole, universal, and variable life), annuities, disability insurance, and long-term care insurance.
6. Health insurance companies offer contingency claims in return for health insurance premiums. Recent increases in health care costs have led to new ways of managing care and controlling costs, including managed care and health maintenance organizations (HMOs). The rising costs of Medicare, Medicaid, and private insurance coverage, as well as the growing number and share of Americans without health insurance coverage, continue to be pressing public policy problems.
7. Property insurance offers financial protection to individuals and businesses from the effects of property loss, damage, or destruction caused by fire, theft, storms, or acts of God. Casualty insurance protects an insured policyholder from the financial claims of others who are harmed by accidents, product failures, or professional malpractice.
8. Ten ways to manage risk in the insurance industry are through effective screening; risked-based premiums; deductibles; coinsurance; threatening cancellation and/or canceling a policy; restrictive provisions; effective fraud prevention; limits on the amount of insurance; reinsurance; and active management of credit, interest rate, liquidity, and exchange rate risk.
9. The McCarran-Ferguson Act of 1945 prohibits federal regulation of insurance companies. As a result, they are primarily regulated at the state level. The National Association of Insurance Commissioners (NAIC) develops model laws and regulations that are often used by state legislatures when revising or writing new legislation. This is done in an attempt to create some consistency among the 50 states. All states require that agents be licensed before they are allowed to sell insurance.

Key Terms

Actuaries, p. **434**
Annuitant, p. **439**
Annuity, p. **439**
Beneficiary, p. **434**
Casualty (Liability) Insurance, p. **441**
Coinsurance, p. **445**
Convertible, p. **437**
Deductible, p. **445**
Disability Insurance, p. **439**
Health Insurance Companies, p. **440**
Health Maintenance Organizations (HMOs), p. **441**
Insurance Company, p. **432**
Long-Term Care Insurance, p. **439**
McCarran-Ferguson Act, p. **447**
Mortality Tables, p. **437**
No-Fault Insurance, p. **442**
Property and Casualty Companies, p. **441**
Property Insurance, p. **441**
Reinsurance, p. **449**
Risk Averse, p. **432**
Risk-Based Premiums, p. **445**
Term Life Insurance, p. **436**
Universal Life Insurance, p. **438**
Variable Life Insurance, p. **438**
Whole Life Insurance, p. **437**

Review Questions

1. Explain the difference between risk and uncertainty. Give an example of a decision influenced by each of these concepts.
2. List and explain the two primary sources of revenue and the main use of funds for insurance companies in general.
3. Briefly explain the primary responsibilities of actuaries, agents, underwriters, and claims adjusters.
4. Explain how adverse selection differs from moral hazard.
5. Explain the salient characteristics of term, whole, universal, and variable life insurance policies.
6. Give a specific example of how a bowling alley would benefit from having both property and casualty insurance.
7. List and explain the 10 ways insurance companies actively manage risk.
8. List and explain four types of professional positions in the insurance industry and their job responsibilities.
9. List and describe the coverage provided by the three main types of insurance companies described in this chapter.

Analytical Questions

10. Briefly explain risk pooling, the essential principle underlying insurance coverage, by using an automobile insurance example.
11. Why might health insurance companies hold fewer long-term assets than life insurance companies?
12. Why is most disability insurance sold through group plans?
13. How do the large numbers of malpractice suits against doctors and the large jury awards to victims affect the price of casualty insurance and health insurance? Explain the possible effect of caps on awards to victims on health insurance costs.
14. Discuss the evidence that racial bias exists in the insurance industry.
15. Can you explain why male college students usually pay more than female college students for exactly the same automobile insurance coverage? Make the case that this is unfair to male students. Make the rebuttal that an insurance company would give to defend its policies.
16. Your instructor has decided that the best way to explain adverse selection and moral hazard is to sell "grade insurance" policies to students in your class. Policyholders who are unhappy with their final course grade can file a claim for any grade they desire. Policies are sold for $20. However, only three policies will be sold in your class. Describe how adverse selection and moral hazard would likely play themselves out in your

course. Give specific examples of how your instructor could amend these policies in an attempt to reduce adverse selection and moral hazard.

17. Go to www.insurance.com or another Internet site that allows you to generate price quotes online. (A Google search in September 2008 generated 13.1 million hits on "term insurance.") What would it cost you to purchase $100,000 of term life insurance at a fixed rate over 10 years? Go back and do the process again. However, this time apply as a male born January 1, 1950, who smokes, has high blood pressure, and is overweight. What would it cost this fictional person? Drawing on the material in the chapter, explain why this second person would likely pay more. If your quote was more expensive than this person's, explain why.
18. Go to http://insurance.yahoo.com and take the "savings quiz." Are you a savvy auto insurance shopper? What suggestions did this site give for you to reduce your premiums? Now go back and click on "quick" quotes for auto insurance. What would it cost you to insure your current automobile? Apply for a second quote and take all of the suggestions from the savings quiz. In addition, pretend that you live in South Dakota. How much did your quoted premium decrease? Why?

Suggested Readings

The American Council of Life Insurers' Life Insurance Fact Book (**www.acli.com**) provides an annual statistical profile of trends and important statistics about the life insurance industry. Tables and figures provide a wealth of information, including numbers of Americans covered, number of insurance companies, consolidated balance sheet information, mortality and life expectancy tables, and more.

For information on socioeconomic discrimination in the property and casualty industry, see Gregory D. Squires, ed., *Insurance Redlining: Disinvestment, Reinvestment, and the Evolving Role of Financial Institutions* (Washington, DC: The Urban Institute Press, 1997). The book is reviewed by Reynold F. Nesiba in *Journal of Economic Issues* 32:3 (September 1998): 901–904. Recent articles on discrimination in the insurance industry include James Daley, "Let's Put the Brakes on Discrimination," *The Independent* (London), August 16, 2008, which argues against basing premiums on age and gender, and Andrew Pollack, "Genetic-Discrimination Ban Moves Ahead in Congress," *New York Times*, April 23, 2008, which reports on progress toward passage of a federal law prohibiting discrimination in insurance and employment as a result of information from genetic test results.

Most insurance regulation takes place at the state, not the federal level. Visiting the National Association of Insurance Commissioners Web page at **www.naic.org/index** can provide information regarding current issues confronting state regulators.

Endnotes

1. An a priori calculation refers to one in which deductive reasoning—moving from cause to effect—is used to make a decision. This differs from a posteriori, or inductive, reasoning, which is based upon experience or inference. One deductively knows, based on probability theory, that the odds of pulling the ace of diamonds from a deck of cards is 1 in 54 (with jokers). One does not need to infer from hundreds of observed experiments that this statement is true. Predicting future commodity prices requires an entirely different approach.
2. "Act of God" is a catch phrase that refers to any other unforeseeable occurrence caused by nature that is not explicitly exempted by the insurance contract. Most homeowners' policies state specific exemptions from coverage. For example, flood damage is not covered in a typical homeowner's policy. Nearly all policies have exemptions for war or nuclear contamination.

CHAPTER NINETEEN 19

Falling markets and a sour economy have opened a gap of more than $200 billion in the pension plans of S&P 500 companies, including Ford and GM. Will taxpayers get stuck with the bill?

—Michael Brush, *MSN Money*
November 26, 2008

New or expanding small business may be denied traditional bank loans because of limited track records or high debt. . . . In these situations, a commercial finance company may be an alternative source of financing for your business.

—http://scoredelaware.org

Pension Plans and Finance Companies

Learning Objectives

After reading this chapter, you should know:

The various kinds of pension plans and finance companies

The benefits provided by pension plans and finance companies

The principal sources and uses of funds for both of these financial intermediaries

The primary regulations and regulatory agencies with which both of these financial institutions must comply

Recent changes in the way these financial institutions do business

RETIREMENT PLANNING AND LIQUIDITY MANAGEMENT

Chapter 18 explained that the existence of uncertainty, combined with the desire to avoid excessive risk, led to risk pooling and the eventual creation of insurance companies. This chapter examines two different types of institutions: pension plans and finance companies. Pension plans (like insurance companies) exist in part to help risk-averse people deal with the uncertainties of retirement planning. However, the goals of finance companies are somewhat different. They help consumers and firms manage liquidity risk by providing a variety of leasing and lending services.

Individuals who are planning for retirement want to amass a sufficient level of wealth to maintain their standard of living after they quit working. If these investors hold funds solely in low-interest-earning savings accounts, they face the possibility that inflation will erode the purchasing power of their assets. Insufficient funds will be available to finance their years of retirement. If investors attempt to avoid this inflation risk by purchasing higher-yielding individual stocks and bonds, they expose themselves to significant default and interest rate risk. Thankfully, pension plans have been developed to assist us in managing these risks and achieving our desired financial goals.

Where pension plans assist individuals and groups with their retirement needs, finance companies provide various types of leasing and lending services to consumers and firms. They aid leasees in avoiding additional debt and standardizing their payment streams. Specialized commercial finance companies also purchase the accounts receivable of other business firms. This provides liquidity to the selling firm and transfers the default risk associated with extending credit from the selling firm to the finance company.

The first section of this chapter describes the various types of pension plans (including the difference between defined-contribution and defined-benefit plans), discusses recent trends in the industry, and explores regulatory issues. We conclude this first section of the chapter with a discussion of the largest public pension system, **Social Security.** Here we discuss recent stresses on this system and plans for its reform. The second section examines finance companies. We compare them to banks and thrifts and describe consumer finance, business finance, and real estate loan companies. We also explain recent trends in the industry and discuss how finance companies manage risks, and conclude with a discussion of finance company regulation.

Social Security
The federal government program that provides retirement and survivors' pensions, and disability and health insurance benefits to qualifying individuals.

PENSION PLANS

Overview

Pension plans have been around almost since the birth of our nation. The first pension plans in the United States were created to provide income for the disabled American veterans of the Revolutionary War. In the early 1800s, benefits were also extended to retired veterans. The federal government continues to be one of the primary providers of pensions through its plans for veterans and retired government employees and through the Social Security program. The first private pension plan in the United States was offered in 1875 by the American Express company, then an important transportation firm. Railroads followed by adding pensions in the 1880s. Labor unions created funds for their members in the early 1900s. Before the creation of Social Security in 1935, however, most Americans worked until they died. If they outlived their ability to care for themselves, they relied on family members to provide long-term care. Contemporary notions of retirement and the prospect of years of retirement (and, increasingly, decades) are a relatively new social, economic, and financial phenomenon.

To assist workers and future retirees with this new reality, tax-exempt intermediaries called pension plans or pension funds have been set up to provide income to workers and/or their spouses after a worker retires, becomes disabled, or dies. They are currently the fastest-growing type of financial intermediary. This rapid growth is often attributed to the steady increase in wealth and income generated in the United States since World War II, the growing need to plan financially for the retirement years, and the significant tax advantages Congress has created for these funds.

Types of Pension Plans

Pension plans are often categorized by: (1) who makes the contributions, (2) the type of sponsorship, and/or (3) the manner in which either contributions or benefits are defined. First, in terms of contributions, most pension plans are **contributory plans** in which both the employee and the employer make contributions. In **noncontributory plans,** only the employer makes contributions.

Contributory Plans
Pension plans in which both the employee and employer contribute.

Noncontributory Plans
Pension plans in which only the employer contributes.

Public Pension Plans

Pension plans can be sponsored publicly (governmental units) or privately (corporations, unions, small businesses, or individuals). The Investment Company Institute's publication *U.S. Retirement Market*, second quarter 2008, reports that total U.S. retirement plan assets reached $16.9 trillion in mid-2008; $4.1 trillion or about one-quarter of these assets, are managed by public pension plans sponsored by state and local government employees, federal civilian employees, railroad retirement, and Social Security's Old-Age, Survivors, and Disability Insurance program. Almost all government employees are covered by pension plans. Exhibit 19–1 shows that the twenty largest employer-sponsored

19-1
The Top 20 Pension Funds/Sponsors Ranked by Total Assets (in U.S. $ millions, September 30, 2007)

Rank	Sponsor (2006 rank)	Assets
1	California Public Employees	$254,627
2	Federal Retirement Thrift	223,338
3	California State Teachers	176,270
4	New York State Common	164,363
5	Florida State Board	142,519
6	General Motors	133,835
7	New York City Retirement	127,945
8	AT&T	117,537
9	Texas Teachers	114,878
10	New York State Teachers	106,042
11	Wisconsin Investment Board	91,615
12	General Electric	88,237
13	IBM	87,481
14	Ohio Public Employees	84,349
15	New Jersey	83,968
16	North Carolina	82,437
17	Boeing	81,079
18	Ohio State Teachers	78,606
19	Verizon	74,780
20	Washington State Board	71,398

Source: Pensions and Investments online: www.pionline.com.

pension funds in the country. The five largest are the California Public Employees, Federal Retirement Thrift, California State Teachers, the New York State Common, and the Florida State Board, are all at the state government level. Each of these funds has over $140 billion in assets under management. The City of New York has a plan for its workers with almost $130 million in assets. Plans such as the Old-Age, Survivors, and Disability Insurance program, the Federal Civilian Employees, and the Railroad Retirement Plan all manage substantial sums not listed here.

Private Pension Plans

A private pension plan is sponsored by a single corporation, union, small business, or individual. As of September 30, 2008, private pension fund assets totaled $5,192.9 billion, a decrease from $6,247.9 billion the year before. This decline was primarily due to a fall in stock prices, which continued into the fourth quarter of 2008. Most of these pension fund assets were sponsored and managed by private pension funds, mutual funds, banks, brokerage firms, and life insurers. The two largest private (corporate) pension funds listed in Exhibit 19-1 are General Motors (number 6), with $133.8 billion in assets, and AT&T (number 8), with $117.5 billion in assets. Privately sponsored pension plans currently cover about half of private sector employees. The Teamsters and other large unions have their own pension plans.

Pension plans have historically been sponsored by large employers to cover their employees. However, as of 2008, less than half of employees in firms with fewer than 100 employees were participating in employment-based retirement plans. Most small-business employees have missed out on these tax-preferred savings vehicles. The Small Business Protection Act of 1996 attempts to meet this need. This act created a retirement savings vehicle for employees of firms with 100 workers or fewer: the **SIMPLE plans (Savings Incentive Match Plan for Employees of Small Employers).** SIMPLE plans provide an affordable way for small firms to offer retirement benefits through employee salary deductions and matching contributions. Employers are generally required to match the contributions of participating workers up to 3 percent of pay or put in a flat 2 percent for all workers regardless of participation. Contributions are set aside pre-tax and grow tax-deferred until they are withdrawn in retirement. Like many other types of tax-deferred retirement plans, employee withdrawals before age 59½ are subject to a 10 percent penalty.

SIMPLE Plans (Savings Incentive Match Plan for Employees of Small Employers)
Simplified defined-contribution plans created by Congress in 1996 to assist small businesses in offering salary deductions and matching contributions to fund retirement savings for their workers.

Individually Sponsored and Self-Employed Private Pension Plans

Although most pension plans are group plans, they can also be set up for individuals. There are three types of privately sponsored individual pension plans: individual retirement accounts (IRAs), Keogh plans, and simplified employee pensions (SEPs).

Individual retirement accounts (IRAs) are unique savings accounts administered by insurance and pension companies and various types of depository institutions. In a traditional tax-deferred IRA, individuals are allowed to deposit a certain sum of money ($5,000 maximum for an individual, $10,000 for a couple as of 2009) into the account without having to pay tax on it or on the interest it earns until the funds are withdrawn at retirement. If funds are withdrawn before the age of 59½, a penalty usually applies. Exceptions are made for the purchase of a home or to finance college expenses. At the age of 70½, the IRA holder must begin withdrawing funds. Congress has recently created the **Roth IRA** (named after Delaware senator William Roth, who sponsored the legislation). Roth IRAs offer better tax advantages for many investors. Contributions to traditional IRAs are tax-exempt; taxes on the gains are postponed until the funds are withdrawn. Although funds deposited into a Roth IRA are not tax-exempt, the accumu-

Individual Retirement Accounts (IRAs)
Tax-advantaged savings accounts administered by insurance companies, pension funds, and other intermediaries for the purposes of accumulating wealth for retirement.

Roth IRA
A special type of individual retirement account in which one's contributions are taxed, but the earnings accumulated within the account are tax-exempt.

lated earnings are never taxed. Hence, they are sometimes called tax-free Roth IRAs. Tax law changes in 2001 (specifically, the Economic Growth and Tax Relief Reconciliation Act) increased maximum annual contributions for Roth IRAs from $2,000 in 2001 to $5,000 in 2009 for those earning $101,000 or less. Individuals with incomes above $116,000 (single) or $169,000 (married) are excluded from Roth IRA participation.

Keogh Plans
Tax-advantaged savings accounts administered by banks and other financial intermediaries for the retirement needs of self-employed people.

Self-employed individuals sometimes find it more difficult to set aside funds for retirement. **Keogh plans** (named after New York congressman Eugene Keogh, who initiated the legislation) were established specifically to create a tax-preferred savings vehicle for self-employed people. Like traditional IRAs, Keogh accounts are handled by banks and other financial institutions. Interest accrues on a tax-deferred basis. Keoghs come in two main types; profit-sharing and money purchase plans.

If contributions to the plan are to be dependent on profits, the plan may be designed as a profit-sharing plan. Although the law requires that contributions be "substantial and recurring," it allows the flexibility to skip contributions entirely in a slow year. Until the Economic Growth and Tax Relief Reconciliation Act of 2001 increased the deduction limit for profit-sharing plans to 25 percent of compensation, there was a 15 percent deduction limit (until 2002). This lower contribution level was a drawback and caused individuals to favor the money purchase plan, which allowed a 25 percent deduction limit but required contributions each and every year. Now that profit-sharing plan contribution limits have been increased, most people choose the profit-sharing plan because of its flexibility.

Simplified Employee Pensions (SEPs)
Small-business pension plans allowed by Congress in 1978 with fewer reporting requirements and costs, and less administrative complexity than traditional pension plans.

The 1978 Revenue Act created **simplified employee pensions (SEPs),** sometimes called SEP-IRAs, to allow small-business owners to make tax-deductible IRA contributions on behalf of their employees and themselves. These plans are similar to Keoghs but have lower administrative costs, greater flexibility in contributions, and fewer reporting requirements. There is one hitch for one-man or one-woman firms. If you have a Keogh or SEP-IRA for yourself and you subsequently hire employees, you must also make the plan available to them and make employee contributions.

Defined-Benefit and Defined-Contribution Plans

Defined-Benefit Pension Plan
Contract promising a specific level of income upon retirement based on the worker's years of service and level of earnings.

Pension plans can be divided into two main types—defined-benefit or defined-contribution plans—regardless of who makes the contributions or the kind of sponsor. A **defined-benefit pension plan** promises employees a specific benefit based on factors such as age, earnings, and years of service. Plans can be modified to pay in the event of death, disability, or retirement. Retirement benefits usually take the form of periodic payments for the lifetime of participants and/or their spouses and are sometimes received as a lump-sum payment.

A long-time employee with a firm may receive a pension of, say, two-thirds of her salary if she has been at the same firm for 30 years. However, if an individual jumps from firm to firm, the pension may be far smaller. This is because most defined-benefit plans require that an employee to be vested—that is, after some period of time, the employee is entitled to benefits. If the employee moves to another employer, he will be able to receive a pension when he reaches retirement age based on his earnings at the original employer. However, if an employee leaves a firm before becoming fully vested, he sacrifices part or all of his retirement benefits. Vesting periods vary by employer. Some employers require as little as one or two years of service to be fully vested; others require up to the legal maximum of seven years.

Benefit calculations can be specified in a variety of ways for eligible employees. The following three examples show the different ways to calculate benefits. Assume that John has been working for the same company for 30 years. His final salary is $40,000

and his average salary over the last five years is also $40,000. A plan may state his benefit as a percentage of salary and years of service with the company; for example, 2 percent of final pay, times years of service, or:

$$0.02 \times \$40{,}000 \times 30 = \$24{,}000 \text{ annually}$$

In some cases, a specific percentage (here, 68 percent) of the employee's highest five-year average earnings is used to calculate retirement benefits; for example:

$$0.68 \times \$40{,}000 = \$27{,}200 \text{ annually}$$

In other cases, the calculation may be based on a specific dollar amount and years of service (say $70 per month at retirement, times the number of years worked). In annual terms for John, this would be:

$$\$70 \times 12 \times 30 = \$25{,}200$$

Some firms also offer the retiree the option to take a lump-sum payment at retirement based on similar sorts of calculations.

In all of the preceding cases, the employer bears the burden and investment risk of funding the pension plan to meet these defined-benefit payment obligations. To fund these promises, employers hire professional money managers, who decide the level of contributions necessary to meet the plan's future obligations. These contributions are supplemented by the investment earnings generated by the plan's assets. In all three of the examples, the amount of annual benefit is a function of either pay (final or average) or years of service, or both. Thus, in many cases workers can significantly increase their annual pension benefit by working a few extra years, especially if they receive regular salary increases.

When actuaries determine that sufficient funds have been set aside to meet future pension disbursements, the plan is fully funded. In the unlikely situation that more than enough funds are available, a plan is overfunded. Underfunding, which means that the funds available are estimated to be insufficient to meet the plan's future payment commitments, occurs more frequently. Exhibits 19–2 and 19–3 list the 10 largest public and private defined-benefit plans as of September 30, 2007. The top public defined contribution plans are sponsored by state-level government organizations such as California, New York, and Florida employees. As of that date, the largest public defined-benefit plan, California Public Employees, had over $254 billion in assets under management, while the largest private plan was that of General Motors with over $133 billion in assets.

Defined-Contribution Pension Plan
Contract specifying that a particular and periodic share of an employee's wages will be contributed by employers, employees, or both.

A **defined-contribution pension plan** is a contract in which specific and periodic contributions to an investment fund are made by employers, employees, or both. For instance, an employer may require an employee to pay 4 percent of pre-tax earnings into the pension plan with the understanding that the employer will contribute an additional 8 percent. These contribution percentages may remain fixed or may change, depending on the employee's length of service, age, or the firm's profitability. Only the contribution is defined. No promise is made regarding the benefit the employee will receive upon retirement. The account is managed by the employee like an individual mutual fund with investment gains, losses, and contributions credited to the employee's account. From the firm's perspective, the primary advantage of defined-contribution plans over defined-benefit plans is that the interest rate and default risk associated with ensuring an adequate retirement is moved from employer to employee. As one might expect, this advantage has been partially responsible for the trend away from defined-benefit plans and toward defined-contribution plans over the last 20 years.

19-2
Top Ten Public Plans, Ranked by Total Assets (in U.S. $ millions, September 30, 2007)

Defined Benefit	Assets	Defined Contribution	Assets
California Public Employees	254,627	New York City Retirement	15,813
California State Teachers	176,270	Texas Municipal Retirement	13,749
New York State Common	164,363	New York State Def. Comp.	10,495
Florida State Board	142,519	Washington State Board	9,158
New York City Retirement	127,945	New York City Def. Comp.	8,807
Texas Teachers	114,878	Ohio Def. Comp.	7,461
New York State Teachers	106,042	California Savings Plus	7,299
Wisconsin Investment Board	91,615	Michigan Retirement	5,175
Ohio Public Employees	84,349	North Carolina	5,053
New Jersey	83,968	Minnesota State Board	4,733
Total	**1,346,576**	**Total**	**87,743**

Source: Pensions and Investments online: www.pionline.com.

19-3
Top Ten Defined Benefit Funds, Ranked by Total Assets (in U.S. $ millions, September 30, 2007)

Corporate Funds	Assets	Union Funds	Assets
General Motors	133,835	Teamsters, Western Conf.	32,600
AT&T	117,537	Teamsters, Central States	21,388
General Electric	88,237	National Electric	14,500
IBM	87,481	Operating Eng. International	10,353
Boeing	81,079	SEIU National	9,964
Verizon	74,780	I.A.M. National	9,302
Ford Motor	57,517	Boilermaker-Blacksmith	9,296
Lockheed Martin	51,436	Electrical Ind., Joint Board	7,484
Alcatel-Lucent	48,498	UMWA Health & Retirement	7,045
Northrop Grumman	37,564	UFCW Industry	6,941
Total	**777,964**	**Total**	**128,873**

Recap

Pension plans provide participants with income at retirement in exchange for premiums now. They are currently the largest and fastest-growing type of financial intermediary. Pension plans can be categorized three main ways: by who contributes to the plan, by sponsorship, and by the manner in which contributions or benefits are defined. In contributory plans, both the employee and the employer make contributions. In noncontributory plans, only the employer makes contributions. Privately sponsored plans can be for groups (individual firms, industry groups, or unions) or individuals (IRAs, Keoghs, SEPs). Publicly sponsored plans cater to local, state, or federal government bodies. A defined-benefit pension plan promises employees a specific retirement payout based on factors such as age, earnings, and years of service. A defined-contribution pension plan is a contract in which specific and periodic contributions to an investment fund are made by employers, employees, or both.

Recent Trends in Private Pensions

In 1979, 82 percent of all pension plans were defined-benefit plans and about 18 percent were defined-contribution. Over time, coverage with defined-benefit plans has decreased

while defined-contribution plans have increased. By the mid-1990s, the numbers were nearly equal. In recent years this trend has continued. The Mercer Consulting Group reported that between 2005 and 2008, 54 percent of private defined-benefit plans barred new entrants, and the value of defined-contribution plans exceeded that of defined-benefit plans. They also report that as of 2009, two-thirds of the top 100 employers will no longer offer defined-benefit plans to their employees.

This trend away from defined-benefit plans is explained by three main factors. First, there was a decrease in the share of employment at large, unionized manufacturing companies, traditionally the largest users of defined-benefit plans. Second, the Pension Protection Act of 2006 increased the cost of offering defined-benefit plans. As a result, the amount of funds firms were required to set aside for future retirees in defined-benefit plans increased. This further discouraged their use. A third and, perhaps, primary reason for the recent trends was the introduction of **401(k) plans** in 1981 and their increasing popularity.

401(k) Plan
A special type of defined-contribution plan introduced in 1981 allowing for greater flexibility in employer and employee contributions.

This special type of defined-contribution plan increased the flexibility that employers and employees have in saving for retirement. These plans are also more portable than traditional plans, which is an important feature as employees change jobs more frequently. Employers are still allowed to give a flat-percentage contribution to all employees as with a traditional pension. However, 401(k) plans also allow workers to make voluntary, pretax contributions to the plan. These plans grow on a tax-deferred basis—contributions to the plans are exempt from taxes and the earnings accumulate tax free until they are withdrawn during retirement. In many cases, voluntary worker contributions are fully or partially matched by the employer up to some predetermined share of the worker's salary. For instance, a firm might make a 4 percent contribution for each employee. Employees are allowed to make additional voluntary contributions that are matched by the employer up to a total of 7 percent of the employee's salary. In many corporations, employer matches are made with company stock. These low-cost plans are easy to set up and manage, and are targeted at small businesses that are less likely to offer retirement benefits to their employees.

The maximum dollar contribution for an individual to a 401(k) plan increases each year to compensate for inflation. From 2008 to 2009 the maximum contribution was raised from $15,500 to $16,500, and the catch up provisions available to those over 50 years of age increased from $5,000 to $5,500. Similar programs for government employees are called 457 plans, and for teachers, 403(b) plans. Some employees, such as professors at state universities, may contribute to both.

Despite their declining relative importance, the total amount of assets in private pension funds continued to grow until late 2007. Up until this point there was a general trend toward holding more assets in the form of corporate equities. Declines in the stock market in 2008 reduced the proportion of assets in the form of corporate equities both because of the decline in the value of such assets held, and as a result of movement away from placing new funds in stocks.

This is a reversal of the previous trend. Between 1979 and 1999, the largest corporate pension funds increased the share of assets held in stock from about 56 percent to 63 percent. Among public funds, equity allocation increased from about 22 percent to 61 percent. These changes were driven by a belief that stock market returns would exceed those available elsewhere in the long run.

Since contributions are received regularly and payments to retirees are fairly predictable, private pension funds as a whole hold mostly nonliquid assets. As of September 30, 2008, the Federal Reserve reported that of the $5,192.8 billion in private pension funds, 39.6 percent were held in corporate equities ($2,058.7 billion), 27.6 percent in mutual funds ($1,432.5 billion), and 17.7 percent in credit market instruments ($917.6 billion).

Despite having a fairly steady revenue stream and predictable future payment obligations, pension funds have had problems. In the early 1960s, the fiscal integrity of pension fund companies was brought into question by allegations of mismanagement, overly restrictive age and service requirements, and the termination of employees nearing retirement. The 1964 failure of the Studebaker automobile plant in South Bend, Indiana, inflicted heavy pension losses on workers and brought the issue national attention. This led to congressional hearings and eventually the passage of federal pension fund regulation and government insurance.

Pension Plan Regulation and Insurance

On Labor Day, 1974, Congress passed the Employee Retirement Income Security Act (ERISA). ERISA established the first federal standards for the financing and operation of private defined-benefit pension plans. It in no way mandates firms to provide pension plans. It merely sets the rules if a firm, union, or other group chooses to operate a pension plan. The act has six main features:

1. A plan's sponsor must make minimum contributions such that projected benefit payments are actuarially sound. Firms are prohibited from waiting until an employee's retirement to set aside funds.
2. All contributions must be invested in a prudent manner. Portfolio managers who fail this "prudent expert" fiduciary rule can face prosecution and conviction. This ensures that the pension manager is looking out for the employees' best interests.
3. Plans must have minimum vesting requirements. Vesting refers to the length of time an employee must work for a company before he or she is eligible for pension benefits. These rules were amended again in 1989, shortening the maximum vesting period to seven years.
4. Plans must increase disclosure of information to employees regarding the contents and financial health of their plans.
5. The Department of Labor was named as the primary regulator to enforce ERISA's provisions.
6. The act created the Pension Benefit Guarantee Corporation (PBGC).

PBGC, or Penny Benny, as it is often called, guarantees that the approximately 43.9 million American workers and retirees with defined-benefit pension funds will receive their promised benefits upon retirement and for life. If a company with an underfunded pension goes bankrupt or if a pension fund is unable to fully provide promised benefits, Penny Benny will step in and make up the difference. In short, PBGC insures defined-benefit pension plans in the same way the FDIC insures the deposits of commercial banks and savings associations. It does not receive any federal funding, but instead charges premiums to participating pension plans. In case of emergency, it can borrow up to $100 million from the U.S. Treasury.

Continuing concern with the possibility that defined-benefit plans might be underfunded led to the passage of the Pension Protection Act of 2006, signed into law on August 17. 2006. This legislation:

1. Requires companies that underfund their pension plans to pay additional premiums;
2. Extends a requirement that companies that terminate their pensions provide extra funding for the pension insurance system;
3. Requires that companies measure the obligations of their pension plans more accurately;
4. Removes provisions that allow underfunded plans to skip pension payments;

5. Raises caps on the amount that employers can put into their pension plans, so they can add more money during good times and build a cushion that can keep their pensions solvent in lean times;
6. Prevents companies with underfunded pension plans from exacerbating their problem by promising extra benefits to their workers without paying for those promises in advance;
7. Requires actuaries to use the equivalent of the projected accrued benefit cost method for determining annual normal cost.

The Pension Protection Act was also designed to encourage workers to save for retirement through defined-contribution plans such as IRAs and 401(k)s, a goal consistent with President George W. Bush's desire to promote an "ownership society." Although the stated goal of this law was to strengthen private pensions, since it increases costs of providing defined-benefit relative to defined-contribution plans, its most lasting impact may be to hasten the demise of defined-benefit plans.

Recap

Decreases in manufacturing sector employment and the advent of 401(k) plans have led to a trend away from defined-benefit plans and toward defined-contribution plans. Because of unacceptable management practices and pension losses on the part of workers, the federal government intervened to regulate the industry and provide insurance for defined-benefit pension plans. The Employee Retirement Income Security Act (ERISA) of 1974 established standards that must be met by all pension plans and created a pension guarantor. The Pension Benefit Guarantee Corporation (Penny Benny) insures defined-benefit pension plans against the risk that a plan's sponsor goes bankrupt or otherwise fails to meet its payment obligations. The Pension Protection Act passed in 2006 was designed to insure that private pension plans are fully funded, but its most enduring impact will likely be to cause further movement away from defined-benefit plans, toward defined-contribution plans.

SOCIAL SECURITY

In addition to playing a significant role in regulating and insuring defined-benefit pension funds, the federal government also manages the best-known public pension plan, Social Security. "A Closer Look" asks whether we should think about the Social Security program as a social insurance program or as a pension plan. We will let you make up your own mind about this. However, since many people use and view this program as their primary source of retirement funds, we will discuss it as a public pension plan.

The Social Security Act was enacted in 1935 to provide old-age retirement benefits. Since that time, it has been amended repeatedly to broaden eligibility and increase benefits. In 1939, the act was amended to include benefits for dependents and survivors. Disability benefits were added in 1956. Medicare and Medicaid insurance programs were added in 1966. In addition to these new benefit programs, minimum retirement ages were lowered (and more recently, raised), more types of employees were covered, and benefit levels were increased. To keep the system solvent, both the tax rate and the amount of income subject to tax have been increased.

Old Age Survivors and Disability Insurance (OASDI)
Core program of Social Security that is funded by payroll taxes to pay retirement and disability payments to eligible individuals and their dependents.

Social Security is funded through payroll taxes. One can see the amount of this payroll tax on their paycheck stub in a box marked FICA. FICA stands for the Federal Insurance Contribution Act, another name for the Social Security Act of 1935. FICA taxes include withholdings for both the **Old Age Survivors and Disability Insurance (OASDI)** program and health insurance (Medicare and Medicaid) benefit programs.

Social Security: Insurance Policy or Pension Plan?

Should we think of Social Security as a life, disability, and health insurance policy or as a pension plan? The metaphor we use to think about Social Security influences the way we evaluate the value of the program and plans for its reform. Some argue that Social Security is a social insurance program. The name of its core benefit program, Old Age Survivors and Disability Insurance (OASDI), suggests as much and distinguishes it from the health insurance (Medicare and Medicaid) aspects of the program. Like automobile, homeowner, or term life insurance premiums, our Social Security tax payments are paid with the understanding that, under certain conditions such as disability or retirement, we (or our surviving dependents) will be eligible to file a claim for benefits. However, if these particular events never happen, we lack the grounds to file a claim and no accumulated asset value is awarded to us or passed to our heirs.

If we view Social Security in this manner, we assess its value by evaluating how much insurance protection we receive for the premiums paid, not by the rate of return on assets. The amount paid in FICA taxes and received in insurance benefits varies based on a person's earnings record, general health, and age. The reason we buy pure insurance products is to provide financial protection in case something unexpected happens. In the case of Social Security, we pay premiums into an insurance system that will provide retirement, disability, and medical benefits to us and/or our dependents when particular conditions are satisfied. From this perspective, criticisms leveled at the low rates of return earned by some Social Security recipients are unfair and moot. We do not inquire about the "rate of return" on premiums paid on automobile, health, or term life insurance. If a person never makes a claim, there is no return whatsoever. If Social Security is just another example of an insurance plan, it is inappropriate to inquire about its rate of return.

Of course, not everyone views Social Security in this way. Valid reasons exist for viewing Social Security as a pension plan. The fixed contributions—15.3 percent of earnings—paid into the system, the monthly "pension" checks received by retirees, and the statements sent out by the Social Security Administration all resemble features of a pension plan. Many of us are familiar with pension plan statements and how to read them. We read our statements regularly to see how rapidly our investments are growing and how much retirement income we can expect to receive in the future. Computing rates of return and comparing these to other investment vehicles is an essential element in assessing the quality of our pension plans. If Social Security is viewed in this way, it fares less well. Recent studies show that workers who retired 20 years ago received back everything they had paid in, plus interest, several times over. Those currently retiring are expected to receive only about a 2 percent real return on their investment. Those younger than 30 are expected to experience negative rates of return—their typical contributions are expected to be greater than their benefits. Expected returns also differ by income level. Low-income workers are likely to pay lower premiums but receive more generous insurance benefits because of the income redistribution aspects of the program. Minimum wage earners, for instance, are likely to receive about one-half of their current pay level in benefits. In contrast, higher-income workers will

pay higher premiums but will not receive the correspondingly high retirement benefits. Instead, many workers who earn more than $100,000 per year will receive less than one-quarter of their previous salary from Social Security benefits. From a higher-income individual's "pension plan perspective"—and ignoring the insurance aspects of the plan—we can see that Social Security appears to be a less-than-optimal retirement vehicle. Nevertheless, it remains an important part of almost everyone's retirement planning. Future beneficiaries of the program should pay attention to proposals for its reform.

Since 1990 (and as of 2009), the OASDI portion of the payroll tax rate stands at 12.40 percent. Half of this (6.2 percent) is paid by the employee; the other half is matched by the employer. The health insurance portion (Medicare and Medicaid) of the payroll tax is 2.9 percent, again split (1.45 percent each) between the employee and the employer. Thus, the combined payroll tax for these programs is a flat tax of 15.30 percent. Self-employed workers pay the full combined amount on their federal income tax return. For the vast majority of people, these taxes apply to their entire earned income. However, higher-income earners receive a substantial break. In 2009, the OASDI tax applied only to the first $106,800 of income. After this maximum is reached, no further tax is withheld. In effect, the tax rate falls to zero. This maximum income level or cap normally increases each year based on increases in average wages. In contrast, the health insurance portion of the tax applies to an individual's entire earnings.

A worker becomes eligible for Social Security benefits by earning 40 "credits." In 2009, each $1,090 of self-employment income or wages earned one credit. A maximum of four credits may be earned in any one year. Thus, for most workers, 10 years of part-time employment is sufficient to qualify for retirement benefits. Young people can qualify for survivor's and disability benefits with even fewer credits. Monthly benefits are determined by a worker's average earnings and age when he or she begins receiving benefits. The higher the worker's lifetime earnings, the higher the benefits. Similarly, the longer a worker waits to accept benefits, the higher the monthly benefit. If a worker begins receiving benefits at age 62 rather than his full retirement age (age 67 for those of us born after 1960), his monthly benefit will be about 30 percent lower. The Social Security Administration provides various benefit calculators on its Web site at www.ssa.gov.

If you are over the age of 25, the Social Security Administration should send a personalized benefits statement about three months before your birthday. If you have enough credits—10 years of paid work is usually sufficient—your statement will include an estimate of retirement, disability, and survivor benefits.

Given the sources and uses of funds, Social Security is set up on a "pay-as-you-go" basis—today's workers are paying the retirement benefits of today's Social Security recipients. Future Social Security recipients will rely on the taxes of the next generation of workers to fund their retirement. Social Security tax receipts are currently greater than payments. A portion of these excess funds are being "deposited" into a trust fund that, in turn, uses the surplus to purchase government securities.

The "Social Security crisis" so prominent in the news media refers to the predicted problem of sustaining Social Security through the 2030s. The crux of the problem is that the 76 million members of the "baby boom" generation born between 1946 and 1964 will begin retiring in 2011. These increased numbers of retirees are expected

to live longer and, therefore, receive more benefits. In 1940, the average life expectancy for a 65-year-old was 12 ½ more years. Today's typical 65-year-old is expected to live an additional 17 ½ years. Further exacerbating these problems, the number of workers supporting each retired person is declining. In 1940, there were approximately 30 workers for each retiree. In 2008, there were 3.0 and by 2030, projections imply there will be 2. The Medicare portion of Social Security is also stressed from these issues and additional pressure from increases in current and expected per capita medical costs. What all of this means is that the surplus in the Social Security trust fund is projected to begin declining in about 2013 when its payments will begin to exceed its revenues. Note that this could happen sooner if economic stagnation reduces wages and thus contributions. By 2034, some projections suggest, the trust fund will have been spent. Without additional funding, Social Security will be able to pay only 75 percent of its expected benefits. This is far from being a threat of bankruptcy, but it is nevertheless a cause for concern and will likely entail changes in public policy. To address this expected funding shortfall, several proposals have been put forward to reform the system, among them increasing revenues, decreasing benefits, or altering the structure of the system.

Social Security: Plans for Reform

One way to ensure that Social Security meets 100 percent of its future payment commitments is to increase revenues coming into the system. This can be done by either raising the tax rate or increasing the tax base on which it is applied. The current OASDI portion of the Social Security tax stands at 12.4 percent, shared equally by the employer and the employee. Without other reforms, this tax would need to be raised to 18 percent to fully meet the system's needs. Both employers and employees would need to increase their contributions to 9 percent of the wage earner's taxable income. Although this increase of 2.8 percentage points (5.6 percentage points combined) represents a substantial tax increase, the "crisis" rhetoric that has so far characterized the debate appears overstated. This is made even more evident by the realization that revenues could also be raised by expanding the tax base. As noted previously, in 2009 OASDI taxes were collected on only the first $106,800 of earned income. By raising this cap, or eliminating it entirely—as is done with the health insurance tax portion of Social Security—considerable revenue could be raised. Some estimates suggest that eliminating the cap would erase half of the predicted deficit. Others, including the system's creator, President Franklin Delano Roosevelt, have suggested using tax revenues raised from corporate and personal income taxes to enhance the revenues flowing into the system.

A second way to address the system's fiscal problems is to reduce benefits. This could be done in a variety ways. Proposals have suggested increasing the retirement age, making it more difficult to qualify for disability; reducing annual cost-of-living increases; or initiating "means testing" of benefits. Means testing refers to the process by which applicants to the program show evidence of financial need to determine what level of benefits, if any, they should receive. Clearly, this would lower and, in some cases, eliminate the benefits paid to many wealthy retirees. One disadvantage is that this would reduce the universal nature of the plan and further reduce political support for it among the wealthy.

A more controversial way of reforming Social Security and meeting the needs of future retirees is to turn the system into a true pension system. This partial or total "privatization" would be done by using the system's funds to purchase corporate securities. Plans under this rubric include three main approaches. The first would allow a portion of workers' payroll taxes to be invested in individual retirement accounts. As the "Looking Out" feature on Chile's "second revolution" explains, this South American

Chile's Second Revolution: A Privatized Social Security System

In 1973, General Augusto Pinochet led an armed revolution in Chile and quickly rose to power. In 1981, Pinochet led a second—this time, financial—revolution. His country was among the first to privatize its public pension system. At the time, the existing public pension system was nearing bankruptcy, caused primarily by an aging population. Chile's leaders believed that only through radically restructuring the system could the benefits of future retirees be assured. Further, they hoped that this restructuring would lead to an increase in savings, boosting domestic investment, and stimulating more rapid economic growth. To address these needs, they imposed a system of individual retirement accounts. Workers were required to invest at least 10 percent of their taxable income into a privately managed, defined-contribution pension fund. The plan appears to have worked.

Between 1981 and 1995, national savings rose from 8.2 percent of GDP to 27.6 percent of GDP. Employment sharply increased, stock market capitalization quadrupled, and Chile created one of the few active, long-term corporate bond markets in South America. Of course, not all of the kudos can go to privatization. Trade liberalization, the privatization of other government-owned entities, and economic growth among its trading partners have all helped to transform the Chilean economy into the most dynamic economy in South America. Robert Holzmann, an economist at the University of Saarland in Germany, asserts that the pension privatization plan has had two indirect effects that are often overlooked. First, the savings plan forced the government to trim its budget. This increased government savings might be the most important reason for Chile's economic recovery. Second, capital markets simply work better now than they did before. The new funds pouring into the system made the markets more liquid and increased the efficiency with which savings were used.

Privatization has not come without problems. The administrative costs of operating individual accounts for each worker are high. These were unnecessarily inflated at the beginning by the need for competing pension funds to spend enormous sums on marketing to attract clients. The costs of maintaining the old system while funding the new pension plan were also significant. The government remains responsible for losses in the old system and serves as a guarantor of a minimum benefit level to workers and retirees in the new system. Thus, even with privatization, it remains exposed to considerable market risk.

Despite these shortcomings, Argentina, Colombia, Peru, Mexico, and Bolivia are all attempting plans similar to Chile's. One lesson from all of these experiments is that in a democracy, privatizing pensions is a more difficult matter than under a dictatorship like Pinochet's. A second lesson is that pension reforms appear to work better in the context of other simultaneous economic reforms. A full assessment must wait until today's pension contributors become pensioners themselves. In the meantime, we can nevertheless hope that these plans will assist these countries in avoiding the economic instability that in the past has led to social unrest and political revolution.

Sources

"Retirement Revolution," The Economist 341, no. 7993 (November 23, 1996), p. 95; "Paying for Greying: Latin American Pensions," The Economist 333, no. 7891 (November 26, 1994), p. 88.

country has pursued privatization aggressively. Chile requires all workers to deposit 10 percent of their earnings into an individual retirement account. The hope there, as well as in the United States, is that higher rates of return can be earned on stocks and bonds, thereby providing retirees with more retirement income. The drawbacks are that this plan would substantially increase workers' exposure to market risk and would likely lead to some retirees receiving much more at retirement than others. Democrats and their organized labor constituents have opposed this type of reform. In contrast, the securities industry sees the prospect of tens of millions of new accounts and ardently supports it.

A second approach to privatization would be to have the federal government use the current Social Security surplus to purchase stocks and bonds. This, too, would hold the prospect of earning higher rates of return for retirees and would eliminate the costs and bureaucracy of setting up tens of millions of individual retirement accounts. The main drawback of this plan is that the U.S. government would become the country's largest shareholder for many companies. Some fear that politicians would use this power to control individual corporations. Another problem that has recently become quite clear is that the logic of this reform is based on an underlying assumption that stocks outperform other investments in the long run, an assumption that may no longer be tenable.

A third approach to privatization is to encourage workers to contribute to personal accounts in addition to their FICA contributions. This would likely lead to most retirees having more funds at retirement. The drawback is that it requires current workers to set aside more of their current earnings. Others point out that these kinds of IRAs already exist.

The biggest problem with all of these privatization schemes, except the last, is that in the short run, they make the problem worse. Diverting funds from current programs to purchase securities means that there is less revenue available to pay current retiree benefits. The costs of moving to privatization would be enormous.

The most favorable solution to all of Social Security's financial problems is to have faster wage growth than expected. Forecasts of the plan's demise are highly dependent on estimates of future revenues and expenses. If the economy were to return to more rapid growth, and if this led to faster wage growth, it is possible that Social Security could remain solvent for additional years and even decades without other changes.

Recap

The largest and best-known pension plan is Social Security. It was created to provide old-age retirement benefits under the Old Age Survivors and Disability Insurance (OASDI) program. Since that time, it has been amended repeatedly to broaden eligibility and increase benefits, including Medicare and Medicaid in 1966. The program is funded on a pay-as-you-go basis—current payroll taxes are used to pay current retirees. With growing numbers of retirees, longer expected life spans, fewer workers for each retiree, and growing per capita health care costs, Social Security is expected to face mounting financing pressures. Plans to address this need to include increasing taxes, increasing the tax base, reducing benefits, and/or various forms of privatization. Faster economic growth would also assist this endeavor by raising incomes and payroll tax revenues more rapidly than expected.

FINANCE COMPANIES

Overview

Finance companies are a second type of specialized, nondepository financial intermediary. They are best described as intermediaries that lend funds (1) to households to finance

consumer purchases; (2) to firms to finance inventories and accounts receivable, and to purchase machinery or equipment; and (3) to both consumers and businesses for real estate loans. Finance companies are not commercial banks, savings associations, or credit unions, although some bank holding companies have finance company subsidiaries. Finance companies differ from banks and thrifts in their sources and uses of funds. Banks and thrifts gather many small deposits and other kinds of purchased funds. These funds are used primarily to make large commercial loans. In contrast, finance companies do not issue deposits.[1] Instead, they issue relatively large-denomination bonds or commercial paper, or take out large loans from commercial banks. These funds are then used to make relatively small consumer, business, and real estate loans. A second characteristic distinguishing finance companies from their deposit-dependent cousins is that finance companies tend to target higher-risk borrowers. To compensate for this greater default risk exposure, finance companies often charge higher rates of interest. They are able to do this because their nondepository status leaves them less regulated than banks and thrifts. Finally, the finance company industry is more heterogeneous in size and services than the bank and thrift industry. Finance companies range in size from multibillion-dollar multinational corporations, to small, single-unit loan companies. Services offered range from diversified providers of financial services to firms that specialize in one particular type of lending. According to the Federal Reserve's Flow of Funds data, of September 30, 2008, finance companies had over $1.9 trillion in assets, with credit market instruments totaling over $1.8 trillion, of which 26 percent were in real estate, 33 percent were consumer credit, and 30 percent were "other loans and advances" (which includes business loans and 11 percent were in corporate and foreign bonds). While many finance companies specialize in one type of lending, others are active in all three lending categories.

Types of Finance Companies

Finance companies are most easily classified into consumer finance, business finance, and real estate loan companies. Real estate loans can be for either household or commercial property. However, in most cases, these loans are made to consumers for a second mortgage on their home.

Consumer Finance Companies

Consumer finance companies offer personal loans to consumers to purchase (or often lease) motor vehicles, mobile homes, furniture, and appliances. They also provide credit card services and assist in the refinancing of debt. These loans are often made to borrowers who are unable to obtain credit elsewhere because of their checkered credit history, low income, or discontinuous work history. To reduce their default risk, finance companies often require some sort of collateral as security. Some finance companies are willing to make personal loans based on a car or mobile home title as collateral. By stopping in and signing over the title to the property, the borrower can obtain a short-term, high-interest rate loan. In most cases, the consumer can continue to drive his car or live in the mobile home. If the consumer fails to make timely payments, the finance company has the title to his property and can sell it. This is essentially the same idea that pawnbrokers, another type of finance company, employ. If someone brings in a piece of personal property, the pawnbroker will make a loan for some amount less than the value of the property. If the loan is not repaid, the pawnbroker has the right to sell the collateral left behind, pocketing the difference.

This same basic idea applies when consumers buy furniture or appliances. In some cases, consumers can apply for "in-store credit" with apparently attractive "90 days same

as cash" or "no payments for 6 months" financing. In most cases, the in-store credit application is really being provided by a finance company, which may be the finance company subsidiary of a bank like Wells Fargo or a separately owned corporation such as Beneficial Finance. The finance company allows the store to fax, telephone, or electronically transmit the loan application for on-the-spot approval or rejection. Once a loan has been approved, the furniture or appliance store originates the loan. It then immediately sells the paper or loan at a discount to the finance company. This benefits the store three ways: (1) it generates a sale that was otherwise unlikely to be made; (2) it eliminates the store's exposure to default risk; and (3) it allows the store to avoid becoming involved in bill processing and collections.

The finance company also benefits. It identifies new customers, some of whom may apply for credit cards. Also, once the initial teaser rate expires, the effective interest rate rises dramatically—to the high teens and low 20s, and sometimes retroactively. If the loan is not paid in the first 90 days, interest begins to accrue as of the date of purchase. Besides being profitable, these loans are also secure. In case of default, the finance company retains the right to repossess the property. **Repossession** occurs when a borrower fails to make payments on time and the finance company goes to the borrower's residence and takes the asset back. Repossession is even easier if the asset in question is being leased rather than purchased. With a lease, the property is technically owned by the finance company. This negates the usual need to transfer the title of ownership back to the lender. Many rent-to-own contracts are set up in this way. The finance company or "leasing company" retains the title on the property until all payments have been received.

Repossession
The process whereby a lender takes back the assets used to secure a loan.

Consumer finance companies are of two types: ordinary finance companies and sales finance companies. The companies described previously are ordinary finance companies—they make secured loans for a variety of different products or firms. In contrast, **sales finance companies,** or **captive finance companies,** make secured loans to consumers to purchase a product from a particular manufacturer or retailer. The "big three" U.S. automakers all have substantial sales finance companies. The General Motors Acceptable Corporation (GMAC) provides attractive financing terms to those interested in purchasing a new GM vehicle. Ford Motor Company and DaimlerChrysler have similar affiliates. Sears Roebuck Acceptance Corporation does the same for purchases made at Sears.

Sales Finance Companies (Captive Finance Companies)
Companies that make loans to consumers so they can purchase a product from a particular manufacturer or retailer.

Business Finance Companies

Finance companies also offer their services to businesses. Business loans, the most common type of loan made by finance companies, are made for three main purposes. The largest category is for equipment leasing and loans. Finance companies also make loans for retail and wholesale motor vehicle purchases and leases, as well as on accounts receivable or factored commercial accounts.

Businesses with a high debt level may find it difficult or undesirable to take on the greater level of debt needed to purchase the equipment or machinery needed in the production process. The down payment might even be too costly. The purchase of railroad cars, jet airplanes, and computer systems all involve substantial expenditures. Instead of purchasing these assets outright, businesses may instead have a finance company purchase the assets for them. The finance company then agrees to lease the equipment back to the firm. The business avoids the appearance of debt on its balance sheet and avoids using a large chunk of working capital as a down payment. The finance company receives a steady stream of rental income and, in the case of missed lease payments, simply sells the equipment to recoup its investment. Given the substantial depreciation on big-ticket capital expenditures, the finance company may also reap tax advantages that the business itself was not able to utilize because of its lower income level. Some firms set up

finance company subsidiaries specifically to take advantage of these benefits. Finance companies also provide outright financing for business equipment purchases and for the purchase of business inventories. This gives firms access to supplies needed in production. The firm repays the loans with the sales of the final product. In some cases, finance companies even make loans so that a company can buy the assets of another company. These leveraged buyouts (LBOs) are riskier ventures because of the difficulty in judging the market value of another firm's assets. However, they promise higher returns than other forms of business lending.

The second largest category of loans made to businesses by finance companies involves retail and wholesale motor vehicle loans and leases. Some dealers of automobiles, boats, and construction equipment are required to purchase fleets of vehicles for their yearly inventory. These often do not sell immediately. To manage this mismatch between expenditures and revenues, finance companies pay for the dealer's new inventory through **floor-plan loans.** As the dealer sells each new vehicle, the revenues from the sale are used to pay off these wholesale loans. In many cases, the same finance company makes the wholesale loan to the dealer and the retail loan to the customer. Few other lenders have an opportunity to make both a wholesale and a retail loan on a car when it is sold to a customer for the first time. Increasingly, loans secured by an automobile, boat, or other title are pooled together and securitized. The finance company generates fee income from the granting of wholesale and retail loans, but avoids exposure to default risk by issuing a security backed by these loan bundles. Automobile leases have become extremely popular. Businesses and individuals both engage in vehicle leases to glean the benefits of lower down payments and the avoidance of taking on debt. Automobile finance companies like GMAC are able to take full advantage of the tax benefits of depreciation and the relatively easy repossession process if a customer fails to make his or her payments.

Floor-Plan Loans
Finance company loan products that allow dealers of automobiles, boats, and construction equipment to use their inventory as collateral for loans that are repaid when vehicles are sold.

A third type of business loan offered by finance companies bases loans on the purchase of accounts receivable. Imagine a business that sells its product on credit, but for a variety of reasons, is not particularly skilled at bill collection, processing, or otherwise managing its accounts receivable. Some of this firm's best customers may make irregular payments. The firm does not wish to offend customers by making aggressive telephone calls or mailing harassing letters demanding payment. To overcome these problems, specialized finance companies, called **factoring companies,** have been created to purchase the accounts receivable of other firms. In a traditional factoring arrangement, a business firm sells its accounts receivable to a factoring company at a discount. The factor takes over the bill processing and collections of these debts. The firm benefits because it is free of the default risk stemming from these receivables and is provided with immediate liquidity to use for other endeavors. The factoring company benefits by buying debts at a discount. Assuming that the factor has carefully checked the quality of the firm's receivables, the factor will have earned itself a profit when the debts are collected. In some cases, finance companies do not actually take over the management of the accounts receivable, but instead make a loan secured by these accounts receivable. If the business fails to make timely payment, the finance company then has the right to collect and retain the funds owed to the business itself.

Factoring Companies
Specialized finance companies that purchase the accounts receivable of other firms at a discount.

Real Estate Loan Companies

Finance companies also offer real estate loans to businesses and individuals. They tend to specialize in second mortgages, wherein a homeowner takes out an additional mortgage loan against the accrued equity in his or her property. They also make home purchase and commercial real estate loans.

Up until 2007 the real estate segment of finance company receivables grew rapidly. In 2007, the total amount of finance company assets comprised of mortgage loans fell from $594 billion at the end of 2006 to $468.6 billion at the end of the third quarter of 2008. Several factors contributed to the rapid growth in real estate lending and the reversal in 2007.

Rapid real estate appreciation from 2002 to 2007 led to increases in homeowner equity—the difference between the market value of the property minus the debt owned against it. To use this equity, homeowners either had to sell their property or borrow against it. Because of their less-regulated structure and lower costs, finance companies had become more adept than other real estate lenders at creating **home equity loans** with longer maturities and higher loan-to-value ratios. Some finance companies offer 125s—second mortgage loans allowing homeowners to borrow up to a total of 125 percent of the value of their home. Finance companies also issue **home equity lines of credit** that function like a credit card but are secured by the homeowner's equity.

Home Equity Loans
Mortgage loans of a specific amount in which one's private residence serves as collateral for the loan.

Home Equity Lines of Credit
Credit cards that are secured by a second mortgage on one's home.

Finance company real estate loans, particularly home equity loans and home equity lines of credit, became quite popular during the real estate bubble years up to 2007, partly because interest payments on consumer credit are not tax deductible, but payments on mortgage interest are. This encouraged homeowners to borrow against their property rather than using other unsecured kinds of consumer credit.

Finance Companies and the 2008 Credit Crisis

Finance companies both contributed to, and became victims of the 2007–2009 credit crisis. Finance companies provided credit to those who otherwise would have had difficulty. When home prices were rising, it seemed that offering home loans to individuals with low or unstable incomes could improve their lives. The wide availability of credit and low interest rates made this possible. A finance company could make loans to relatively risky borrowers and obtain the funds they needed by borrowing and issuing bonds or commercial paper. Because GMAC, the financing affiliate of General Motors, had a better credit rating than individual car buyers, they could borrow at a much lower rate and pass some of the saving on to their customers.

Much of the credit extended by finance companies was in the form of subprime loans targeted primarily at low-income and minority borrowers. **Subprime lending**[2] refers to loans in which a borrower has a blemished (or nonexistent) credit record. A lender makes a higher-fee, higher-interest-rate loan to compensate for the greater risk of delinquency and higher costs of loan servicing and collection. Thus, the term "subprime" technically refers to the perceived riskiness of the loan (less than "prime" quality), not to the interest rate charged, which is typically much higher than that charged for prime loans. The growth of finance companies into the mortgage market during the "bubble years" raised questions about the practice of lending to less-credit worthy borrowers at significantly higher interest rates. It now appears finance companies acted more as "predatory lenders," preying on uninformed borrowers rather than serving a valuable function not provided by other traditional types of lenders.

Subprime Lending
The issuing of high-fee, high-interest-rate loans typically made to borrowers with blemished (or nonexistent) credit records.

To finance the industry's growth, finance companies increasingly came to rely on securitization to provide the liquidity necessary to fund their entry into the real estate market, as well as automobile loans. Finance companies also provided funds for leasing cars to consumers, and equipment to firms. As credit became more difficult to obtain for everyone except government, the volume of both lending and leasing decreased. For example, in July 2008 Chrysler announced they would no longer lease their vehicles, and GM and Ford reduced incentives to lease a car.

Like banks and thrifts, most finance companies face credit, interest rate, and liquidity risk. Default risk is a major concern for all lenders and particularly so for finance companies, since their customers are typically higher-risk borrowers. As a result, finance companies have higher rates of default. By requiring adequate collateral on their loans, charging higher risk-adjusted interest rates, securitizing when appropriate, and prudently applying credit scoring and other credit assessment techniques, finance companies should be able to obtain higher returns, at least during normal times. Regardless of these techniques, finance companies remain particularly vulnerable to downturns in the economy. The economic climate after 2007 hurt finance companies by both making it more difficult to obtain funds to lend, and increasing the defaults on loans they made in the past.

Although finance companies compete directly with banks and thrifts, they face much less regulation. Finance companies do not accept deposits, so federal regulators have less reason to restrict their activities. However, like other lenders, finance companies are subject to federal fair-lending laws prohibiting discrimination in lending and truth-in-lending laws that require disclosure regarding the annual percentage rate charged and the total interest paid over the life of the loan. As with regulation of insurance companies, finance company regulation occurs primarily at the state level and varies significantly from state to state. Recently, some finance companies have become bank holding companies in order to benefit from federal assistance, such as GMAC, which was renamed Ally Bank in early 2009. Finance companies that operate within a bank holding company structure are subject to more regulation, but also benefit from the greater stability.

GRAMM LEACH BLILEY

The Financial Modernization Act of 1999 changed the way depository institutions did business. The most significant impact of this act was the combining of the pension fund and finance companies with the banking and insurance services and the securities companies. It allowed all of these various types of companies to be brought together onto one corporate organizational chart.

Until 2007 it appeared that these new financial conglomerates could meet the needs of consumers with even blemished credit and help them to purchase a home, finance a car, and purchase big-ticket items such as a refrigerators. While consolidation continues to occur in the banking sector, the ready flow of financing to nearly any consumer seems to be a thing of the past.

Recap Finance companies are nondepository intermediaries that lend funds to households to finance consumer purchases; to firms to finance inventories, accounts receivable, and to purchase machinery or equipment; as well as to both consumers and businesses for real estate loans. Some consumer loans are made by captive finance companies that make loans only for a particular manufacturer's or retailer's products. Business finance companies make loans to help businesses pay for inventory, manage accounts receivable, or provide leasing services. Real estate lending by finance companies grew rapidly until 2007. This lending targeted the subprime and manufactured housing segments of the market. Finance companies are especially vulnerable to default risk and hurt by a reduction in available credit in the economy. Since finance companies do not accept deposits, they remain less strictly regulated than other types of lenders.

Summary of Major Points

1. Pension plans, or funds, provide income to workers and/or their spouses after a worker retires, becomes disabled, or dies. They are currently the most rapidly growing type of financial intermediary.
2. Pension plans are categorized by contribution-type, sponsorship, and/or whether contributions or benefits are defined. Defined-benefit plans have declined in importance over the past 20 years as defined-contribution plans have increased in popularity.
3. Pension plan standards were set with the passage of the 1974 Employee Retirement Income Security Act (ERISA). Defined-benefit pension plans are insured against a firm's failure to meet payment obligations by the Pension Benefit Guarantee Corporation (Penny Benny).
4. Social Security provides retirement, disability, survivor, and health benefits to qualifying citizens. Unlike ordinary pensions, Social Security is funded on a pay-as-you-go basis. The system pays current benefits from current payroll taxes.
5. Over the next three decades, the Social Security system will face funding challenges from a growing numbers of retirees, longer life spans, fewer workers for each retiree, and growing per capita health care costs as the baby boom generation ages. These will likely be met by increasing tax revenues or decreasing benefits, or by creating some form of privatization to boost future earnings. Faster rates of economic growth and increases in wage rates may raise tax revenues sufficiently to indefinitely postpone the crisis.
6. Finance companies are nondepository intermediaries that lend funds to households to finance consumer purchases; to firms to finance inventories, accounts receivable, and to purchase machinery or equipment; and to both consumers and businesses for real estate loans. The real estate segment of receivables, including subprime and manufactured housing lending, has experienced the most rapid growth.
7. Like all intermediaries, finance companies face credit, interest rate, and liquidity risk. Compared to banks and thrifts, finance companies are more vulnerable to default risk because of the riskier types of loans they offer. Finance companies are less vulnerable to interest rate and liquidity risk because of the similar maturities between their assets and liabilities and their absence of reliance on deposits.
8. Finance companies face less regulation at the federal level than other intermediaries because they do not accept deposits. Nevertheless, regulation regarding fair lending and truth-in-lending still apply, as do state-level regulations about the size and maturity of loans and the maximum interest rate that may be charged on loans.
9. The ultimate impact of the post 2007–2009 financial crisis on finance company operations is still unclear.

Key Terms

401(k) Plan, p. **460**
Contributory Plans, p. **455**
Defined-Benefit Pension Plan, p. **457**
Defined-Contribution Pension Plan, p. **458**
Factoring Companies, p. **470**
Floor-Plan Loans, p. **470**
Home Equity Lines of Credit, p. **471**
Home Equity Loans, p. **471**
Individual Retirement Accounts (IRAs), p. **456**
Keogh Plans, p. **457**
Noncontributory Plans, p. **455**
Old Age Survivors and Disability Insurance (OASDI), p. **462**
Repossession, p. **469**
Roth IRA, p. **456**
Sales Finance Companies (Captive Finance Companies), p. **469**
SIMPLE Plans (Savings Incentive Match Plan for Employees of Small Employers), p. **456**
Simplified Employee Pensions (SEPs), p. **457**
Social Security, p. **454**
Subprime Lending, p. **471**

Review Questions

1. Explain the fundamental difference between the following category pairings: contributory versus noncontributory pension plans, public versus private pension plans, and defined-benefit versus defined-contribution pension plans.
2. What advantage do Roth IRAs have over traditional IRAs?
3. What kind of organization would be most likely to offer SIMPLE plans?
4. Why has there been a trend away from defined-benefit and toward defined-contribution pension plans?
5. Would you rather have a defined-benefit or a defined-contribution pension plan? Why? (Hint: What are the advantages and disadvantages of each of these types of plans?)
6. What are the six main features of ERISA? What is "Penny Benny"?
7. What was the basic purpose of the Pension Protection Act of 2006?
8. Summarize the primary causes of the Social Security crisis and possible plans for the system's reform.
9. What are the three main types of loans that can be made by a finance company?
10. Why are finance companies subject to less regulation than banks and thrifts?
11. How do the interest rates on subprime mortgages compare to those on ordinary mortgages? What can explain the difference?
12. Go to www.ssa.gov and click on "Benefits Planners." Scroll down and find the calculators to estimate Social Security benefits in today's dollars. Use "1. Quick Calculator" to compute an estimate of monthly retirement benefits at age 66 and the family maximum monthly disability/survivor benefits for two different workers. The first worker is 50 years old and earns $20,000 per year. The second worker is 50 years old and earns $200,000 per year.

Analytical Questions

13. Given the current funding structure of Social Security, why should a college-aged student be interested in the education received by today's elementary students?
14. Make the case that Social Security should be viewed as a pension plan. Make the opposite case that it should be thought of as an insurance plan.
15. Assume that Jaciel has been working for the same firm for 25 years. Over the last 5 years, her salary has increased by $1,000 each year from $41,000 to $45,000. The average salary of her final 5 years with the company is $42,000. Which of the following defined-benefit plans will Jaciel prefer? Why?
    a. Plan A: 2.5 percent of final salary times years of service
    b. Plan B: 68 percent of her highest 5-year average earnings
    c. Plan C: $90 per month times the number of years worked
16. What strategies do finance companies employ to reduce default risk?
17. Why would someone with credit card debt consider taking out a home equity loan to pay it off?

Suggested Readings

Jeff Brown analyzes the current problems with government pension insurance in "Guaranteed Trouble: The Economic Effects of the Pension Benefit Guaranty Corporation," *Journal of Economic Perspectives* (Winter 2008).

A wealth of information regarding retirement plans in the United States is available from the Investment Company Institute. Their "U.S. Retirement Market" publication, available at **www.ici.org/pdf/retmrkt_update.pdf** is particularly useful in providing data on assets held in private sector pension plans, both defined-benefit and defined-contribution.

Stephanie Costo explains issues such as the increasing importance of nontraditional retirement plans in "Trends in

Retirement Plan Coverage over the Last Decade," *Monthly Labor Review* (February 2006).

Michael J. Clowes, *The Money Flood: How Pension Funds Revolutionized Investing* (New York: John Wiley & Sons, 2000), explains how the rise of managed pension funds has come to dominate financial markets. He also provides a troubling scenario of what is likely to happen to stock and bond markets when baby boomers stop pouring money into pension funds and instead begin taking it out.

For an engaging history and overview of fringe finance companies (such as pawn shops and check-cashing outlets), as well as who uses them and why, see John P. Caskey's *Fringe Banking: Check-Cashing Outlets, Pawnshops, and the Poor* (New York: Russell Sage Foundation, 1994).

Endnotes

1. A few states do allow finance companies to offer deposits under certain conditions; however, these are the exceptions. Deposits remain a very small source of funds for the industry.
2. The term "subprime lending" can also refer to credit cards and automobile loans as well as mortgage loans. Finance companies have been playing a growing role in these markets.

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CHAPTER TWENTY 20

People tell their friends about their winners and the IRS about their losers.

Securities Firms, Mutual Funds, and Financial Conglomerates

Learning Objectives

After reading this chapter, you should know:

What securities firms are and what financial services they provide

What the various types of mutual funds are

What hedge funds and real estate investment trusts (REITs) are

What the role of government-sponsored enterprises (GSEs) is

What financial conglomerates are and why they have grown so much in recent years

THE BOILER ROOM

Seth was a young, intelligent, upper-middle-class, frustrated college dropout who wanted to make a "quick, easy buck." In the fast-track economy of the 1990s, he saw many people had struck it rich in the stock market. From his apartment, Seth had been running a successful but illegal gambling operation that catered to college students who played cards between classes. His big chance came when a customer asked him to go to work for J.T. Marlin, a securities firm out on Long Island. He was told that like many other young stockbrokers in New York, he would be able to make $1 million within three years if he worked hard. Seth went for the bait.

He soon discovered that the securities he would be selling were bogus. The corporations issuing them had no assets or products, and the securities existed only on paper. Friends of Michael Brantley, the owner of J.T. Marlin, owned the fake corporations. The funds that were raised went to these friends, who then shared them with Brantley. In this way, the brokers working for J.T. Marlin could be paid commissions that exceeded the maximum allowed by securities regulations. Prices were pushed artificially high because of aggressive brokers who worked in a "boiler room" and created a false demand for the stock. Lies were told to potential investors about the prospects of the fake corporations, and unscrupulous brokers employed high-pressure sales techniques. Apparently, not all of the brokers knew the depths of the scam and chose to look the other way as they made millions.

After all the shares of the spurious corporations had been sold, the brokers no longer pushed the stock and its price fell through the floor. Investors were left with worthless securities. Many unsuspecting investors who hoped to make a killing in the market lost everything they had. Brantley, his friends, and the brokers who work for J.T. Marlin made a bundle.

Needless to say, the firm was violating many government regulations and committing many crimes. Regulators were hot on its trail. Eventually, J.T. Marlin was closed down and the owners hopefully brought to justice. For immunity and to save his father's career (his father was a judge), Seth Davis turned state's evidence.[1]

You may recognize that interesting plot if you saw the hit movie *The Boiler Room*. It is far from realistic in that the overwhelming majority of securities firms operate above board, and regulators are keeping closer watch over the industry, particularly since the mutual fund scandal of the early 2000s. The movie does, however, capture some aspects of how securities firms operate, particularly in a booming economy. Brokers can be aggressive and investors can be naive. Sometimes, buyers do minimal research into the quality of the securities they purchase. Finally, financial prices can change dramatically based on rumors or whims.

In this chapter, we consider securities firms—investment banks, securities brokers, and dealers. As noted, not many securities firms are like J.T. Marlin in that they do not deal with phony securities or pay illegal commissions. Instead, securities firms are important in the marketing of newly issued and previously issued financial claims. They "grease the wheels" in the raising of funds for net borrowers and the transferring of debt and equity securities among investors. Also, the investment banking industry is in the process of ongoing change due to the collapse, mergers, or changing structure of the five seminal investment banks in the ongoing financial crisis of 2008.

We also look at mutual funds and government-sponsored enterprises (GSEs) in this chapter. Investment banks, brokers and dealers, mutual funds, and GSEs are the major financial institutions that make up the securities industry. Many of these firms are experiencing severe stress due to the financial crisis in 2008. As noted in Chapter 3, Fannie Mae and Freddie Mac have been taken over by the federal government. These

institutions have played central roles in the financial system and hence it is not surprising that many of them were under severe strain in late 2008.

The emergence of financial conglomerates is also discussed. Financial conglomerates meld together financial services once provided separately by several intermediaries and differing financial institutions. In this way, conglomerates offer a variety of financial services under one roof and operate on a nationwide and global basis. Note that the ongoing financial crisis of 2008 hastened the emergence of financial conglomerates by encouraging mergers between healthy and distressed firms. For example, Bank of America purchased the investment bank Merrill Lynch and Countrywide Financial, and J.P. Morgan Chase Bank took over the investment bank Bear Stearns, with the injection of $29 billion from the federal government.

By structuring the text as we have, we hope to give you a more representative picture of the dynamic trends among major financial institutions and the key roles they play in the financial system. We also acknowledge the major changes going on within the securities industry and the incredible changes that will occur in the next few years because of the ongoing crisis.

SECURITIES FIRMS

Securities firms aid in the smooth functioning of the financial system. There are two main functions of securities firms: investment banking and buying and selling previously issued securities. Investment banking deals with the marketing of newly issued securities in the primary market. Brokers and dealers assist in the marketing of previously issued securities in the secondary market. Some securities firms provide both functions; others provide only one or the other.

During the 1990s, securities firms experienced tremendous growth as the average daily trading volume of U.S. securities increased 512 percent. In the bear market of the early 2000s, the industry shrank, only to rise again from 2003 to 2007. As noted above, these trends have reversed dramatically in 2008, as many security firms have bought, sold, and held many of the "toxic" securities that have caused the financial meltdown in 2008. At the same time, households have shifted their liquid financial assets away from bank deposits and into financial securities. The percentage of household financial assets in bank deposits fell from 55 percent in 1975, to 23 percent in 1990, and 16.3 percent in 2007. The corresponding value for direct mutual fund share ownership increased from 3.5 percent in 1990 to nearly 12 percent in 2007.[2]

Investment Banks: The Primary Market

Investment Banks
Financial institutions that design, market, and underwrite new issuances of securities in the primary market.

We first discussed investment banks in Chapter 3. **Investment banks** are financial institutions that design, market, and underwrite new issuances of securities—stocks or bonds—in the primary market.[3] Merrill Lynch (part of Bank of America), Smith Barney (part of Citigroup), Morgan Stanley, and Goldman Sachs are some of the better-known investment banks. Their main offices tend to be in New York City, but they are electronically linked to branch offices in other major cities in the United States and around the world.

The design function of the investment bank is important because a corporation may need assistance in pricing the new financial instruments that it will issue in the open market. The corporation looks to the investment bank to provide advice about the design of the new offering. In return for their services, the investment bank is paid a fee. In addition to their primary market activity, many investment banks are also brokers and dealers in the secondary markets.

A Closer Look

Google's Unusual Initial Public Offering

In August 2004, Google became a publicly traded company. The path for a typical company to "go public" is to have its initial offering of ownership shares (common stock) underwritten by a prestigious and well-connected investment bank or syndicate of banks. The lead investment bank determines an appropriate price and number of shares and thus the total monetary value of the offering. Investors rely on the reputation of the investment banks in deciding to invest or not. Investment banks charge a fee, typically between 4 and 7 percent, for underwriting the new issue and for standing ready to purchase stock in the new company if necessary. Investment banks might set a low initial price and then allocate these low-priced shares to preferred investors. If the price rapidly increases, these initial investors will personally benefit from the "pop." But Google was not a typical firm, and its founders, Larry Page and Sergey Brin, resolved to take the firm public in a way that would benefit it and its new owners more, and the investment banks less.

First, they choose to use an open Dutch auction method to determine the price. This involves potential investors submitting bids of the number of shares desired at different prices. For example, say a new company offered 100 shares of its stock for sale, and investors offered to purchase 30 shares at a price of $70 each, 60 shares at $60, 110 shares at $50, and 180 shares at a price of $40. Those investors willing to pay $70, $60 or $50 would be able to buy at the lowest price where quantity demanded was at least 100, that is, $50. At this price, a total of 200 shares would be demanded but only 100 were offered, so a method for allocating the 100 shares would be needed. For example, each investor could receive 100/200 or 50 percent of the shares they demanded. Thus, the three investors would purchase 15, 30 and 55 respectively.

Google's initial public offering took place on August 19, 2004, at a price of $85 per share, implying a total value of $23 billion. On the first day of trading, the share price jumped to $100, and by October of 2008, the price of one share of Google was worth more than $386 (down from its peak of $714 in December 2007).

Responsibilities for New Offerings

Initial Public Offering (IPO)
An offering of stocks or bonds to the public by a company that has not previously sold securities to the public.

There are two types of new offerings. When a company has not previously sold financial stocks or bonds to the public, the offering is an **initial public offering (IPO)**. The investment bank will try to establish an appropriate price by looking at stock prices of other firms in the industry with comparable characteristics. Because no previously issued securities are being publicly traded, it is usually much more difficult to determine the price at which securities in an IPO should be offered. In the case of bonds, investment banks look to the market prices of existing bonds with comparable maturity, risk, and liquidity. The issuer's existing degree of leverage (reliance or borrowed funds) is also a determinant of how much can be raised and at what price in the bond market.

Seasoned Issuance
The offering of new securities by a corporation that has outstanding previously issued securities.

When stocks or bonds have been previously issued, the offering is called a **seasoned issuance.** The price of the new issue should be the same as the market price of the outstanding shares. However, the investment bank must still anticipate how the new

issue will affect the market price of the outstanding shares. Likewise, with a seasoned issuance of bonds, the investment bank must anticipate how the greater degree of leverage will affect the price at which the new bonds can be sold.

Timing. Timing is one of the most important factors affecting the selling price of new securities. For example, it may be a good time to sell newly issued shares if the corporation's outstanding stock were trading at relatively high prices, if favorable earnings reports have recently been issued, and if the economy is particularly strong. A relatively larger amount of funds can be raised by issuing fewer shares at a higher price than if the stock were trading at a lower price. Likewise, if long-term interest rates are relatively low and profit expectations are high, it may be a good time to issue bonds.

The role of the Securities and Exchange Commission. Once the amount, type, and pricing of securities have been established, the investment bank assists the corporation in filling out and filing the necessary documents with the **Securities and Exchange Commission (SEC).** The SEC is a government regulatory agency that was created in 1934 to regulate the securities industry. Primary areas of regulation include setting "disclosure" requirements for new securities issues and monitoring illegal and fraudulent behavior in securities markets. As noted above, securities firms have played a central part in the financial crisis of 2008. An SEC ruling in 2004 that allowed for much greater leveraging (reliance on borrowed funds) among the largest investment banking firms has been cited as contributing to the crisis.

Securities and Exchange Commission (SEC)
The government agency that regulates the securities industry and monitors illegal and fraudulent behavior in securities markets.

The SEC maintains active supervision of investment banks, particularly with regard to information that must be disclosed to potential investors. A corporation must go through the formal procedure of filing with the SEC if the securities issuance is higher than $1.5 million and if the term to maturity is more than 270 days. A **registration statement** must be filed with the SEC before the offering can be issued. This statement contains information about the offering, the company, and other disclosure information, including relevant information about management, what the funds will be used for, and the financial health of the corporation. Once the registration statement has been filed, the SEC has 20 days to respond. If the SEC does not object during the 20-day period, the securities can be sold to the public. The lack of an objection by the SEC in no way means that the new securities are of high quality or that the price is appropriate. It simply means that it appears that the proper information has been disclosed to potential investors. The **prospectus,** which is a subpart of the registration statement, must be given to investors before they purchase the securities. It contains all of the disclosures and pertinent information about the new offering that the SEC requires.

Registration Statement
A statement that must be filed with the SEC before a new securities offering can be issued.

Prospectus
A subpart of the registration statement that must be given to investors before they purchase the securities.

Credit rating. Investment banks also assist in obtaining a credit rating for the new bond issues from Standard & Poor's, Fitch's, or Moody's Investors Services. A trustee is selected to monitor whether or not the corporation fulfills the terms of the offering as outlined in the **bond indenture.** The terms of the offering along with many other provisions are spelled out in the bond indenture before the bonds are issued. Investment banks may also assist in arranging that the issuance of new stock is listed (traded) on an exchange and/or in the over-the-counter market.

Bond Indenture
A document that outlines the terms of a bond issuance.

Underwriting and marketing. Once the necessary steps to issue the new securities have been taken, the investment bank takes on the responsibility of underwriting and marketing the securities. In underwriting the security, the investment bank purchases the entire issuance at an agreed-upon price. It then assumes responsibility for marketing the newly issued securities. If the price at which the bank sells the securities is higher than the price it paid, the bank will earn a profit on the spread. If the securities sell for less than the agreed-upon price, the investment bank accepts the loss.

Syndicate
A group of investment banks, each of which underwrites a proportion of new securities offerings.

Sometimes one investment bank may be reluctant to take full responsibility for a new issuance. In this case, the bank may form a **syndicate** by asking other investment banks to underwrite part of the new offering. The syndicate is merely a group of investment banks, each of which underwrites a portion of a new securities offering. In a syndicate, each participating investment bank earns the profit—or assumes the loss—on the portion of the new offering it underwrites.

Investment Banks and the Functioning of the Primary Market

As a key player in financial markets, investment banks facilitate the smooth and orderly functioning of primary markets. They stand ready to buy and sell and to adjust prices—literally making a market. If there are 100,000 shares of a stock for sale at a particular price, and if buyers take only 80,000 shares at that price, the investment bank that bought the securities may hold them for a time to keep the price from falling erratically. Or the investment bank may alter prices until all, or most, of the shares are sold. Thus, the investment bank enables the ongoing shuffling and rearranging of portfolios by standing ready to hold the securities if there is no immediate buyer. Although these actions can involve risk for the investment bank, they enhance market efficiency and contribute to an efficiently functioning financial system. The investment bank is rewarded with profits from fees for designing and assisting in the underwriting of the new securi-

20-1
U.S. Corporate Underwriting Activity, 1985–2008 (Billions of Dollars, Rounded)

Year	New Debt Issues	New Equity Issues	Total Underwritings
1985	$98	$33	$131
1986	217	57	274
1987	211	53	264
1988	201	37	238
1989	164	31	195
1990	169	24	193
1991	281	76	357
1992	386	102	488
1993	535	131	666
1994	390	77	467
1995	441	97	539
1996	584	152	736
1997	785	153	938
1998	1,107	153	1,260
1999	1,084	192	1,275
2000	1,076	205	1,281
2001	1,454	170	1,624
2002	1,400	154	1,554
2003	1,794	156	1,950
2004	2,086	203	2,290
2005	2,601	190	2,791
2006	3,148	191	3,339
2007	2774.3	247.5	3,021.8
2008	937.1	242.6	1,179.7

Source: Securities Industry and Financial Markets Association (SIFMA), **http://www.sifma.org/research/statistics/other/keystats.pdf.**

ties and (as you saw earlier) from hopefully selling the securities at a higher price than what they paid for them.

Exhibit 20-1 shows U.S. corporate underwriting activity since 1985. Note that new debt issuances exceeded new equity issues in every year between 1985 and 2008, usually by increasingly larger amounts. Outstanding debt does not grow as fast as the new issuances would suggest because some debt issues mature each year, while equity issues do not mature. However, in some cases, stocks are bought back and retired by the corporations that issued them. Note also the relatively large issuances of equity in the late 1990s, when stock valuations were particularly high.

Private Placement

Private Placement
The sale of new securities to a limited number of large investors; because the number of investors is small, the underwriting process is avoided.

Investment banks also handle **private placement**. This is an alternative for a corporation issuing new securities that bypasses the process described previously and places the new securities offering privately. In a private placement, new securities are sold to a limited number of investors. Because the number of investors is small, they are of necessity very large investors such as commercial banks, insurance companies, pension plans, or mutual funds. Private placements occur more frequently with bonds than with stocks.

Private Equity

Private equity funds have historically been a major source of funding for start-up companies and for firms that are in financial distress. Private equity funds are investment companies that buy publicly held companies and convert them to private ownership—usually through a limited partnership. Although the market for private equity started in the 1960s, it expanded rapidly in the mid-2000s. This represents a significant change in the way corporations are owned. Private equity firms avoid the disclosure regulations that publicly traded firms face. They also avoid the accounting regulations put on publicly traded firms by the Sarbanes-Oxley legislation following the corporate scandal of the early 2000s. Some of the better known companies that have been bought or are in the process of being bought are Chrysler, Dunkin' Brands (owners of Dunkin' Donuts, Baskin-Robbins, and Togo's), Toys "R" Us, Hertz, Neiman Marcus, Univision, Qantas Airlines, Clear Channel Communications, Bausch and Harrah's Entertainment, and Albertsons.

Recap

Investment banks design, market, and underwrite the issuance of new securities (stocks and bonds) in the primary market. The securities may be an IPO or a seasoned offering. In addition to advising the issuer about market conditions and prospective prices, the investment bank assists in filing the necessary forms with the SEC so that the new securities can be sold publicly. A registration statement must be filed with the SEC. Part of the registration statement is the prospectus that contains information and disclosures about the issuance. The prospectus is distributed to investors. The SEC is concerned that appropriate information is disclosed to the public; approval by the SEC to sell the securities is in no way an endorsement of their quality or an acknowledgement that the price is proper. Private placement of securities to a limited number of investors is an alternative to going through the underwriting process. Private equity firms have recently increased in importance in funding start-ups and distressed companies.

BROKERS AND DEALERS: THE SECONDARY MARKET

Broker
An individual who arranges trades between buyers and sellers of securities for a fee.

Brokers and dealers make up brokerage firms, which are securities firms that also facilitate the smooth and orderly functions of secondary financial markets. **Brokers** arrange

trades between buyers and sellers—that is, they arrange for a buyer to purchase securities from a seller. The broker charges a brokerage fee, or commission, for arranging the trade. **Dealers** are market makers who, in addition to arranging trades between buyers and sellers, stand ready to be a principal in a transaction and may maintain an inventory of securities. Dealers stand ready to purchase and hold previously issued securities sold by investors. Because the dealer carries an inventory of securities and then sells them to other investors, there is the risk that the price of the securities will fall and the brokerage firm will experience a capital loss.

Dealer
An individual who arranges trade and stands ready to be a principal in a transaction.

Market Orders
Orders by an investor that direct the broker or dealer to purchase or sell securities at the present market price.

Limit Orders
Orders that instruct the broker or dealer to purchase securities at the market price up to a certain maximum or to sell the securities at the market price if it is above a certain minimum.

Bid Price
The price at which a dealer is willing to buy securities.

Asked Price
The price at which a dealer is willing to sell securities.

Short Sell
Investors' instructions to brokers or dealers to borrow shares of stocks and sell them today with the guarantee that the investors will replace the borrowed stocks by a date in the future.

Margin Loans
Loans to investors for which the proceeds are used to purchase securities.

Margin Requirement
The percentage of a stock purchase that can be borrowed.

Types of Orders

Three types of orders may be placed with brokerage firms: market orders, limit orders, and short sells. **Market orders** direct the broker or dealer to purchase or sell the securities at the present market price. **Limit orders** instruct the broker or dealer either to purchase the securities at the market price up to a certain maximum, if possible, or to sell the securities at the market price if it is above a certain minimum. Securities are bought at one price (the **bid price**) and sold at a higher price (the **asked price**).

A **short sell** instructs the broker or dealer to borrow shares of stocks and sell them today with the guarantee that the borrowed stocks will be replaced by a particular date in the future. The investor engages in a short sell if he or she believes that the stock's price is going to fall in the future and that the borrowed shares will be paid back with shares purchased in the future at the lower price. A high volume of short sells indicates that investors believe that the stock's price is going to fall. If the price does not fall, the buyer of the short sell must purchase the shares at a higher price and thus loses money. If many buyers of short sells are in this position, the market price is pushed even higher.

Margin Loans

Full-service brokerage firms not only arrange for the trading of securities but also give investment advice to potential investors. In addition, they may make loans, called **margin loans,** to investors to help them purchase securities. In this case, investors do not have to put up funds equal to the full value of the purchase. Instead, they can purchase stocks on the margin by borrowing. The **margin requirement** is the percentage of a stock purchase that can be borrowed as opposed to being paid in readily available funds. The current margin requirement, which is set by the Fed, has been 50 percent since 1974 and applies only to initial purchases. Many individual brokerage firms set margin requirements higher than 50 percent and vary them depending on the stocks being traded and the trading behavior of individual customers.

Brokerage Fees

Until 1975, all brokerage firms charged investors virtually the same brokerage fees for executing trades of financial securities. Brokerage firms distinguished themselves among investors by engaging in non-price competition. Some attempted to offer better and more attentive advice established through market research. Others had geographical advantages, name recognition, or other attributes that led to better customer relationships. All of this began to change when Congress passed the Securities Acts Amendment of 1975 that eliminated fixed commissions. Instead of engaging only in non-price competition, brokerage firms could compete by offering lower fees.

Discount brokerage firms provide only limited or no investment advice, but their fees are much lower than those of full-service brokerage firms. In recent years, because of increased competition among brokerage firms and the emergence of discount brokers

Online Trading

What is online trading? In general, it means trading stocks, mutual funds, and money market shares via the Internet. Brokers and dealers, of course, use computers for most of their trading. However, online trading usually refers to an individual's use of computers for trading.

Online trading offers the public more control over trading and over their financial accounts. However, even more significantly, it offers lower fees for executing trades and hosting financial accounts. Online trading brokerage firms can do this because they use technology to automate these processes. This makes trading less costly and increases the volume that can be handled.

Before the Internet, only a few firms offered computerized trading, mainly through direct dial-up connections. The customer base was very small. However, with the explosive growth of the Internet, the number of online trading brokerage firms and customers has shot upward. The number of online accounts increased from zero in 1994 to about 10 million in 2000. Although the rate of growth in online trading accounts slowed in the early 2000s, some researchers estimated that as of 2008, the number of such accounts was nearing 50 million.

The increased popularity of online trading has brought about a new set of brokerage firms coming from three major sources. One source is discount brokerage firms seeking new ways to offer low-cost trading services. The second source is new companies created as online trading brokerage firms. The final source is existing full-service brokerage firms coming late into the online trading market; these firms have added online trading to their list of services to prevent the loss of customers to other online trading firms.

Even though many traditional full-service brokerage firms have added online trading to their list of services, they still have experienced a rapid decline in commission revenues. Consequently, these brokerage firms have concentrated on improving information services such as advising and consulting, while offering other advanced trading services such as making margin loans to their customers.

Other types of online traders include people who do not work for brokerage firms but still trade for a living—commonly called *daytraders*—and people who have other jobs to earn a living and trade only as frequently as they wish. The latter group includes people with savings who want to earn extra money in addition to their primary income, often to build funds for retirement. Both types of online traders use the services of online trading brokerage firms.

Daytraders, however, typically use specialized online trading firms because they need more sophisticated services. The brokerage firms used by daytraders provide more sophisticated software and more real-time, direct, and detailed access to information and stock exchanges. This is often referred to as *direct access trading.* An example of this is NASDAQ Level II quotes. Typically, the general public and other online traders see only one price at a time listed for a particular security (for example, IBM stock). NASDAQ Level II, however, shows several prices and volumes for recent trades

of a particular stock. This level of information is of little use to most non-daytraders, although it is sometimes offered to those with big accounts who engage in heavy trading.

Online brokerage firms engaged in price wars in the mid- to late 1990s. However, pricing has stabilized, and firms now compete more on features such as ease of use and quality of information. This competition has brought about two new services in the online trading market: (1) trading in foreign stock markets and (2) using remote handheld devices, such as cellular phones and two-way pagers, to get online information and to execute online trades.

and online trading, brokerage fee revenues have fallen. In place of trading fees, brokerage firms are earning more from advising fees and from interest income on margin loans. The development of the Internet allows for the further evolution of securities marketing by allowing for online trading. "A Closer Look" on p. 485 explores the emergence of online trading.

In addition to regulation by the SEC, the securities industry is also self-regulated by the **Financial Industry Regulatory Authority (FINRA),** which was created by the consolidation of regulatory functions of the National Association of Securities Dealers (NASD) and the New York Stock Exchange. Brokerage firms that are registered with the SEC must also purchase insurance for their customers from the **Securities Industry Protection Corporation (SIPC).** SIPC is a nonprofit membership corporation that U.S. registered brokers and dealers are required by law to join. Congress established SIPC in 1970. Its purpose is to protect investors' securities from liquidation by the brokerage firm. Each investor is insured for $500,000. Note that this does not protect investors from losses because of falls in securities prices; however, it does protect the investor from losses resulting from the bankruptcy or insolvency of the brokerage firm.

The Financial Industry Regulatory Authority (FINRA)
A nongovernmental regulator of the U.S. securities industry with authority over more than 5,000 brokerage firms. FINRA was created in July 2007 by consolidation of regulatory functions of the NASD and the New York Stock Exchange.

Securities Industry Protection Corporation (SIPC)
A nonprofit membership corporation established by Congress that provides insurance to protect investors' securities from liquidation by the brokerage firm.

The income of securities firms depends on the fees and commissions they generate in their day-to-day activities. As of December 31, 2008, the financial assets of security brokers and dealers were about $2,982.9 trillion, a sizable increase from $1,613 trillion just four years earlier in 2003, and $83.3 billion in 1982. These figures reveal the growth of trading within the industry, despite smaller commissions, as financial markets have created new types of financial instruments such as derivatives that first exploded and then imploded in the financial crisis of 2008.

Recap

Brokerage firms are important financial institutions because they facilitate the smooth functioning of securities markets. Brokers arrange the trading of financial securities among corporations and investors in exchange for a brokerage fee. Dealers not only arrange trades but also buy and sell financial securities for their own portfolios in order to make a market. Market orders direct the broker or dealer to purchase or sell the securities at the present market price. Limit orders instruct the broker or dealer either to purchase the securities at the market price up to a certain maximum if possible or to sell the securities at the market price if it is above a certain minimum. A short sell instructs the broker or dealer to borrow shares of stocks and sell them today with the guarantee that the borrowed stocks will be replaced by a date in the future. The investor engages in a short sell if he or she believes that the stock's price is going to fall in the future and that the borrowed shares will be paid back with shares bought at a lower price.

INVESTMENT COMPANIES

Investment Companies
Companies that own and manage a large group of different securities for investors who have purchased shares of the companies.

Unlike the securities firms just described, **investment companies** are financial intermediaries that raise funds from many small investors by selling shares in the company. The funds are then pooled together and used to purchase financial securities. Investment companies reduce risk for individual investors by purchasing hundreds or even thousands of different securities. This allows individual investors to diversify to a much greater extent than they would be able to by purchasing individual securities on their own. In addition, because large blocks of securities are bought and sold, the investment company can take advantage of volume discounts, and the transactions costs per share are lower than if smaller amounts of securities had been purchased or sold. Investors share in the gains and losses proportionate to the size of their investment.

Open-End and Closed-End Companies

Open-End
A mutual fund (type of investment company) that continually sells new shares to the public or buys outstanding shares from the public at a price equal to the net asset value.

Closed-End
Investment companies that sell a limited number of shares like other corporations but usually do not buy back outstanding shares.

Mutual Funds
Investment companies that pool funds from many small investors by selling shares.

Money Market Mutual Funds
Mutual funds that deal in money market instruments with an original maturity of one year or less.

Investment companies may be **open-end** or **closed-end.** An open-end fund continually sells new shares to the public or buys outstanding shares from the public at a price equal to the net asset value. The net asset value per share is found by subtracting the liabilities of the mutual fund from the market value of the securities that the fund owns and dividing the difference by the outstanding number of shares.

The vast majority of investment companies are open-end companies called **mutual funds.** Mutual funds that deal in money market instruments with an original maturity of one year or less are called **money market mutual funds.** They issue more shares as investors demand them. Because they buy and sell their own shares, mutual fund shares are not traded on organized exchanges. Mutual funds sell their own new shares to investors and stand ready to buy back outstanding shares.

Closed-end investment companies sell shares like other corporations, but usually do not buy back outstanding shares. Once the sale of a limited number of shares is completed, the fund is "closed" to new purchases, but the shares may be traded like shares of stock on organized exchanges. Because the price of a share of a closed-end fund is determined by supply and demand, it can differ from the net asset value.

Load and No-Load Companies

Load
A sales commission paid to a broker to purchase mutual funds.

No-Load
Mutual funds that are purchased directly from the mutual fund company and are not subject to a load.

Some investment companies require that a **load,** or sales commission, be paid to a broker to buy into a fund. **No-load** funds are purchased directly from the mutual fund company without a broker or a sales commission.

Both load and no-load companies deduct a percentage from the net asset value each year to administer the funds. The fees are usually in the range of 0.2 to 1.5 percent. Both types of funds may also deduct a fee called *12b-1* (named for the SEC regulation that authorizes the fee) for marketing and advertising expenses. By law, the load, administrative fees, and 12b-1 fees cannot exceed 8.5 percent of the investment for loaded funds. Finally, there can be a redemption fee, called a *back-end load*, to sell the investment company shares. An investor should know all of the fees before investing in a fund.

Growth of Investment Funds

Investment funds, particularly mutual funds, have experienced incredible growth since the late 1980s. One reason for this trend is legislation that gave individuals control over where their pension funds are invested, and many have chosen mutual funds. By 2007, over 45 percent of U.S. households owned mutual funds. Exhibit 20-2 shows the growth of mutual funds, money market mutual funds, and closed-end investment funds from

20-2
The Value of Outstanding Shares of Investment Companies, 1982–2008 (Billions of Dollars)

Year	Money Market Mutual Funds	Open-End Mutual Funds	Closed-End Investment Companies
1982	219.9	76.9	7.5
1983	179.5	112.1	7.4
1984	232.2	135.6	6.4
1985	242.4	245.9	8.3
1986	290.6	426.5	14.5
1987	313.8	480.2	21.3
1988	335.0	500.5	43.2
1989	424.7	589.6	2.5
1990	498.3	608.4	52.9
1991	535.0	769.5	71.2
1992	539.5	992.5	93.5
1993	589.6	1,375.4	116.1
1994	602.9	1,477.3	117.8
1995	745.3	1,852.8	134.4
1996	891.1	2,342.4	144.7
1997	1,048.7	2,989.4	149.4
1998	1,334.2	3,613.1	151.0
1999	1,578.8	4,538.5	152.1
2000	1,812.1	4,435.3	141.9
2001	2,240.7	4,135.5	139.5
2002	2,223.9	3,638.4	150.8
2003	2,016.4	4,654.2	205.6
2004	1,879.8	5,436.3	245.9
2005	2,006.9	6,048.9	270.7
2006	2,312.1	7,068.3	294.3
2007	3,053.2	7,798.3	318.9
2008	3,376.5	6,588.3	256.5

Sources: Flow of Funds Account of the United States, Z.1, Board of Governors of the Federal Reserve System, various issues.

1982 to 2007. Note that the rapid changes in the value of outstanding shares was due not only to additional funds flowing into or out of mutual funds but also to changes in market valuations. Also note that the dollar amounts invested in open-end mutual funds are much higher than those invested in closed-end investment companies.

Often, many types of mutual funds are offered by a single investment company. Investors can own several different funds within one investment company. They can choose the funds they prefer depending on their investment needs. Investors can also move their money in and out of various funds within one company at a relatively low cost. Some of the better-known and larger investment companies that you may have heard of are Fidelity, Vanguard, American Funds, Putnam, Janus, Franklin, and T. Rowe Price.

Exhibit 20-3 outlines various types of funds that investors can select, depending on their particular goals and risk tolerance.

Fund of Funds
A mutual fund that invests in a portfolio of other mutual funds rather than individual stocks and/or bonds.

Investment companies also create new funds that invest in several mutual funds. In reality, the investor purchases a **fund of funds.** For example, Vanguard's STAR fund

20-3
A Sample of the Types of Mutual Funds

Stock Funds

Aggressive growth funds seek capital appreciation by investing in small companies with potential for growth; such funds are risky but often pay high returns.

Global equity funds invest in stocks from around the world, thereby achieving greater diversification than that achieved by investing in comparable stocks provided by one country; the downside is exposure to losses if exchange rates change adversely.

Growth and income funds invest in companies that are expected to grow and that pay dividends.

Income-equity funds invest in companies expected to pay high dividends.

Index funds invest in a market basket of stocks that replicates the basket included in a stock market index such as the S&P 500; index funds attempt to match the performance of the index.

Sector funds invest in stocks of particular industries such as biotechnology or health care; because diversification is less than that achieved in more broadly based funds, returns can be more volatile.

Socially conscious funds invest in companies they believe to be ethically responsible; depending on the specific values and goals, these funds may avoid stocks of companies involved with cigarettes, alcohol, gambling, weapons, or nuclear power; they may also avoid stocks of a country whose leadership they believe is repressive.

Bond Funds

Corporate bond funds invest only in corporate bonds.

Global bond funds invest in bonds from around the world; the exchange rate risk can be high.

Ginnie Mae funds invest in Ginnie Mae mortgage-backed securities.

High-yield bond funds invest most of their portfolio in junk bonds; these funds offer the potential for high returns but also entail high risk.

Long-term municipal bond funds invest in a broad base of municipal bonds; earnings are exempt from federal taxes.

State municipal bond funds invest in municipal bonds from one state; earnings are exempt from federal taxes and from state taxes for investors living in the issuing state.

U.S. government income funds invest in U.S. government bonds and government agency securities.

Stock and Bond Funds

Balanced funds invest in some combination of stocks and bonds to preserve principal, generate income, and achieve long-term growth.

Flexible portfolio funds can vary relative investments among stocks, bonds, and money market instruments depending on management.

Income mixed funds invest in stocks and bonds to earn high dividend and interest income.

Convertible securities funds invest in securities (such as preferred stock or bonds) that can be converted to common stock; such securities offer the potential to share in earnings if the company does very well by converting to common stock.

invests in nine different Vanguard funds. In general, 60 to 70 percent of investments are held in stock funds, 20 to 30 percent in bond funds, and 10 to 20 percent in money market mutual funds. The advantages to investors are that funds of funds achieve much greater diversification than if they invested in only one mutual fund, and they save the

Cracking the Code

Investment Companies

In *Barron's* weekly publication, *The Wall Street Journal*, or online, you can find quotations for open-end and closed-end mutual funds. The purpose of this "Cracking the Code" is to familiarize you with how to decipher those quotes.

FUND	NAV	Net Chg	YTD % Ret	3-Yr % Ret
American Century 1st				
EquIndex	5.31	−0.09	−9.1	16.2
EqGro	21.96	−0.31	−9.3	14.6
EqInc	7.31	−.011	−6.3	16.4
IncGro	26.82	−0.34	−7.2	13.9
LgCoVal	6.52	−0.15	−8.9	12.5
StrMod	6.49	−0.03	−5.3	25.4

Source: Barron's, March 3, 2008.

Open-End Mutual Funds

The following quotes are from the March 3, 2008, edition of *Barron's*, and show a group of six different mutual funds offered by American Century 1st. The funds differ by the amount of risk, and the name of each fund often describes the type of financial instruments in which it invests.

Look at the underlined row. In the first column, *EqGro* is the name of the fund within the group of American Century 1st Funds. As the name (short for Equity and Growth) implies, this fund invests in growth stocks that are held in the hopes of high potential appreciation as opposed to current income from dividends. The second column gives the net asset value (21.96) as of the end of the previous week, February 29, 2008. The third column gives the net change in the net asset value from the previous Friday (−0.31), while the fourth column gives the year-to-date percent return to the fund (−9.3), which in this case is from January 1, 2008, to February 29, 2008. The fifth and final column gives the three-year percent return (+14.6). In this example, the net asset value is $21.96, down $0.31 from the previous Friday, the year-to-date percent return is negative 9.3 percent, and the three-year return from February 2005 to February 2008 is positive 14.6 percent in total.

Note that if you invest in the *EqGro* fund of the American Century 1st Funds, you are investing in one of six funds offered by American Century 1st Funds, not in a fund of funds. An investor can invest in one or more of the funds to tailor the amount of overall risk to his or her specific needs. Larger mutual fund companies offer far more than six different funds. For example, Fidelity Investments offers more than 175 different no-load mutual funds.

Closed-End Funds

Below is a portion of the closed-end funds section of the March 3, 2008, edition of *Barron's*. This portion looks at U.S. government bond funds. Look at the underlined row. In the first column is the fund's name, BR Enhcd Govt (EGF), for Blackrock Enhanced Government Fund, followed by the fund's ticker symbol (EGF). The second column gives a one-letter abbreviation of the exchange (N) on which the fund is traded. The N stands for the New York Stock Exchange. The third column gives the net asset value ($18.01). The fourth column gives the closing market price of the fund ($17.37) on Friday, February 29, 2008, the previous trading day. Because this is a closed-end fund, the market or closing price can be more or less than the net asset value. In this case, the net asset value ($18.01) is more than the market price of the fund.

FUND NAME (SYMBOL)	Stock Exch	NAV	Mkt Price	Prem/ Disc	12 mos Yield
U.S. Government Bond Fund					
AllianceBernInc (ACG)	N	8.69	8.37	−3.7	8.1
BR Enhcd Govt (EGF)	N	18.01	17.37	−3.6	7.8
MFS Govt Mkes (MGF)	N	7.31	7.00	−4.2	5.9
WstAstInftMgt (IMF)	N	19.29	17.17	−11.0	4.3
WstAstClymrinfLnkOpp (WIW)	N	14.00	12.25	−12.5	6.1
WstAstClymrinfLnkSec (WIA)	N	13.90	12.28	−11.7	5.7

Source: Barron's, March 3, 2008.

($17.37), and the fund is trading at a discount. The fifth column gives the percentage premium or discount (above or below the net asset value) at which the fund was trading the previous week (–3.6 percent). The current discount can be calculated: ($17.34 – $18.01)/$18.01 = –.036, or – 3.6 percent. The final column gives the percentage 52-week market return (7.8 percent). For bond funds, the 52-week market return is based on the past 12-month income distributions as a percent of the current market price.

time and effort of investing in several different mutual funds on their own. A disadvantage is that costs can be high because both the individual funds and the fund of funds may charge fees. If investors pick different funds on their own, they can avoid the fund of funds fees.[4] By December 2008, there were over 8000 mutual funds that belonged to the Investment Company Institute (ICI), the national association of investment companies in the United States, with combined assets of $9.6 trillion. To put these numbers in perspective, note that stocks of only about 2,800 individual companies trade on the New York Stock Exchange.

Recap

Investment companies are financial intermediaries that pool the funds of many investors to invest in several hundred or even thousands of stocks. For any given investment, investment companies offer greater safety and more diversification than investing in just one or a few company's stocks. Money market funds invest in financial instruments with an original maturity of one year or less. Some mutual funds invest in bonds or some combination of both stocks and bonds. An open-end fund continually sells new shares or buys shares from the public at the net asset value and is called a *mutual fund.* Closed-end investment companies sell a limited number of shares that may be traded on the open market and on organized exchanges. The value of open-end funds (mutual funds) greatly exceeds that of closed-end investment companies. The price of closed-end investment companies is determined by supply and demand and can differ from the net asset value. Mutual funds and closed-end investment companies can be either load or no-load funds and have experienced tremendous growth in recent years.

HEDGE FUNDS

Hedge Fund
A nontraditional type of mutual fund formed as a partnership of up to either 99 or 499 wealthy investors with large minimum investments; attempts to earn maximum returns regardless of rising or falling financial prices.

Historically, a **hedge fund** was a nontraditional investment fund formed as a partnership of up to 99 "accredited" investors who invested in a variety of often risky securities. An accredited investor was one who had at least $1 million in investable assets. In April 1997, the SEC expanded the rules by allowing some hedge funds to raise money from 499 "qualified" investors. In this case, a *qualified investor* is an individual who has a minimum net worth of $5 million, or an institution such as a pension fund or mutual fund with at least $25 million in capital. Today, both types of hedge funds exist.[5]

For all hedge funds, a general partner usually organizes the fund and is responsible for making day-to-day trading decisions. Limited partners put up most of the funds but have limited or no say in the day-to-day decision making. Partners who buy into the hedge funds are wealthy individuals and institutions—minimum investments start around $250,000, and many hedge funds have much higher minimum requirements. Hedge funds may also limit withdrawals or require that funds be invested for a minimum time period, such as 10 years.

Because there are a limited number of wealthy investors, hedge funds are not regulated in the same way that traditional investment pools or mutual funds are. They are not

required to file a registration statement and may engage in many trading strategies from which traditional mutual funds are barred. These strategies include borrowing funds to invest, purchasing many types of option and derivative instruments, short selling, and dealing in real estate and commodities.

Hedge funds attempt to earn high or maximum returns regardless of whether prices in broader financial markets are rising or falling. The funds trade securities and other creative financial instruments and try to outperform traditional investment funds by employing novel trading strategies.

In general, hedge funds use riskier investment strategies than traditional mutual funds, although some are less risky than others. As you have seen, the funds often rely on borrowed funds (leveraging) as well as the funds of the partners. This leverage increases the potential for profits but also magnifies the potential for losses. Short selling to take advantage of falling prices and the use of some risky financial instruments can also result in large losses if prices do not move in the anticipated direction. In general, hedge funds outperform other mutual funds when markets are falling.

Traditionally, hedge funds charge high fees and take a large percent of the profits. For example, some charge a 2 percent annual management fee and take 25 percent of the profits. The remainder of the profits is distributed to the partners based on their percentage of ownership in the fund.

Although the first hedge fund was established more than 50 years ago, the number and assets of hedge funds have grown tremendously since the mid-1990s. Domestic hedge funds now number more than 3,000. Under the 2001 U.S. Patriot Act, hedge funds are required to meet new anti-money-laundering restrictions to prevent money-laundering activities from funding terrorists. Offshore hedge funds are located outside the United States, and they are difficult for most U.S. investors to invest in because of certain tax consequences. The number of partners in offshore hedge funds is unrestricted.

At the present time, hedge funds are becoming more accessible for investors because of the development of *funds of hedge funds.* A fund of hedge funds invests in multiple hedge funds, each usually employing a different investment strategy. Because of pooling, they have lower required minimums for participation and offer less risk due to diversification into many hedge funds.

Some of the strategies employed by hedge funds include:

1. Selling borrowed securities (short selling) in the hope of profiting by buying the securities at a lower price on a future date
2. Exploiting unusual price differences between related securities in anticipation of making a profit when the prices come into more traditional alignment
3. Trading options and other derivatives
4. Borrowing to invest (leveraging) so that returns are increased

Real Estate Investment Trusts (REITs)
A special type of mutual fund that pools the funds of many small investors and uses them to buy or build income property or to make or purchase mortgage loans; pass-through institutions in which the rents from the income property and/or the interest income from the mortgages are passed through to shareholders.

REAL ESTATE INVESTMENT TRUSTS

A **real estate investment trust (REIT)** is a special type of mutual fund that pools the funds of many small investors and uses them to make investments. Whereas other mutual funds invest only in financial instruments, REITs may invest in real property as well. Their funds are used to buy or build income property or to make or purchase mortgage loans, unlike those of traditional mutual funds. Another difference is that to some extent, they also raise funds by taking out bank loans or issuing debt. REITs are pass-through enterprises in that rents from income property and/or interest income

from the mortgages are passed through to shareholders. Shareholders are also entitled to any capital gains from the properties that the REITs own.

At least 75 percent of the assets of REITs must be either real property (generally commercial or industrial real estate) or mortgages. The majority of REITs invest in real property such as shopping malls, apartment complexes, hotels, golf courses, and other commercial buildings for income. REITs may either buy or provide the funding to build income property. The income from property provides a steady, dependable stream of income for investors. Some REITs either make or purchase mortgage loans on commercial property, and some do both.

REITs resulted from legislation passed by Congress in 1960. The intent of the legislation was to give small investors an opportunity to invest in commercial real estate. At that time, REITs could own income property but not manage it. REITs did not become very popular until 1986, when the restrictions on managing income property were removed. Now individual REITs have different characteristics and may be highly specialized, depending on the investment strategy and management style of the fund's manager. They are virtually diversified holdings of real estate investments that are professionally managed.

By law, REITs must return 95 percent of their earnings to shareholders each year. Therefore, if they want to expand, they must issue new equity or debt or take out bank loans. REITs are also attractive because most of their earnings (95 percent of which are passed through) are exempt from corporate federal and state income taxes, thereby avoiding double taxation and allowing for fairly predictable income streams.

Shares of REITs are traded on organized exchanges like shares of stock. Thus, they are liquid investments even though their equity is in real property and long-term mortgages. In recent years, the spreads between the bid and asked prices have narrowed significantly, signaling that the secondary markets are becoming more highly developed. Prices of REITs are determined by supply and demand. In this sense, they are like closed-end investment companies because the price can deviate from the underlying value of the assets owned.

Prices of REITs fell in the 1998–1999 period as investors flocked to high-tech stocks, and then again in 2007 and 2008, as a result of falling U.S. real estate prices. The total amount of U.S. REITs increased rapidly from $136 billion in 2003 to $403.7 billion in 2006, before falling back to $338.1 billion by December 31, 2007.

Recap

A hedge fund is a type of mutual fund that has fewer than either 99 or 499 wealthy investors. The SEC does not regulate these funds. Hedge funds attempt to earn high returns for their investors regardless of whether financial prices are going up or down. Hedge funds engage in risky investment strategies. A REIT is a type of mutual fund that pools the funds of many small investors and uses them to buy or build income property or to make or purchase mortgages. These funds are pass-through institutions in that the rents from the income property and/or the interest income from the mortgages are passed through to shareholders. Whereas other mutual funds invest only in financial instruments, REITs may invest in real property as well as financial instruments. Shares of REITs are traded on organized exchanges. By law, REITs must return 95 percent of their income to shareholders each year. REITs allow for the integration of commercial real estate markets and capital markets.

GOVERNMENT-SPONSORED ENTERPRISES

Government-Sponsored Enterprises (GSEs)
Publicly held corporations that are chartered by Congress.

Government-sponsored enterprises (GSEs), as the name suggests, are corporations that are sponsored or chartered by Congress. Despite the federal charter, most GSEs are privately owned and privately managed. Some GSEs have issued shares of stock that are publicly held like shares in other corporations, and the stocks of these GSEs are traded on organized exchanges.

GSEs issue short-term securities that sell at a discount and long-term bonds that pay semiannual coupon payments. The majority of the issuances are long term. The proceeds are used to assist in some aspect of lending that the federal government has deemed desirable. GSEs operate mainly in the areas of housing, farm credit, and student loans. The securities that GSEs issue, called *government agency securities*, are considered government securities for SEC purposes.

In most instances, the federal government has no legal obligation to guarantee the timely payment of interest and principal of GSE securities. However, many market

20-4
Financial Assets and Liabilities of Government-Sponsored Enterprises, 1982–2008 (Billions of Dollars)

Year	Total Financial Assets	GSE Securities Outstanding	Total Liabilities*
1982	254.8	205.4	249.1
1983	256.5	206.8	250.3
1984	297.7	237.2	291.0
1985	324.0	257.8	319.6
1986	346.4	273.0	342.8
1987	374.4	303.2	370.1
1988	421.7	348.1	416.1
1989	454.2	373.3	447.6
1990	477.6	393.7	469.1
1991	496.8	402.9	486.0
1992	552.3	443.1	538.7
1993	631.1	523.7	614.4
1994	781.8	700.6	761.7
1995	896.9	806.5	873.4
1996	988.6	896.9	964.1
1997	1,099.4	995.3	1,070.3
1998	1,403.8	1,273.6	1,368.1
1999	1,720,6	1,591.7	1,681.1
2000	1,969.4	1,825.8	1,922.5
2001	2,300.8	2,114.0	2,247.1
2002	2,543.3	2,339.9	2,475.6
2003	2,794.4	2,564.2	2,747.1
2004	2,882.9	2,613.0	2,818.0
2005	2,819.4	2,542.9	2,736.8
2006	2,872.9	2,590.5	2,782.0
2007	3,183.3	2,831.4	3,083.6
2008*	3,407.8	3,154.8	3,357.0

September 30, 2008
*Note: GSEs have other miscellaneous liabilities in addition to outstanding securities. The difference between total assets and total liabilities represents stockholder equity.
**Note: Student Loan Marketing Association (Sallie Mae) is included until 2004, when it was fully privatized.
Sources: Flow of Funds Accounts of the United States, Z.1, Board of Governors of the Federal Reserve System, Washington D.C., various issues.

participants assume that the government is the de facto guarantor of the payments. In the financial crisis of 2008 when Fannie Mae and Freddie Mac were put into conservatorship by the government, this was proved to be the case. Although shareholders in the company were expected to lose everything, the worth of the securities issued by them was never a question. The yield spread between government agency securities and U.S. government securities is due to differences in liquidity and risk. The yield spread can be significant because secondary markets do not have the breadth and depth of Treasuries. If market participants question the de facto government guarantee, the spread can also widen. Exhibit 20-4 shows the financial assets and liabilities of GSEs from 1982 to 2008. In recent years, GSEs have increased significantly in terms of their size and market share. This is particularly true with respect to lending in the housing sector.

The GSE Housing Market

Federal National Mortgage Association (Fannie Mae)
A former GSE that issues bonds now guaranteed by the U.S. government, and uses the proceeds to purchase mortgages or mortgage-backed securities of banks.

Federal Home Loan Mortgage Corporation (Freddie Mac)
A former GSE that issues bonds now guaranteed by the U.S. government, uses the proceeds to purchase mortgages or mortgage-backed securities of thrifts.

In late 2008 the two largest GSEs **Federal National Mortgage Association (Fannie Mae),** the **Federal Home Loan Mortgage Corporation (Freddie Mac),** were placed under the conservatorship of their regulator, the Federal Housing Finance Agency, FHFA (formerly the Office of Federal Housing Enterprise Oversight, OFHEO). Although Fannie Mae and Freddie Mac are in conservatorship, it appears their fundamental operations will not change much in the immediate future. These former GSEs had been exempt from state and local corporate income taxes and were supported by a line of credit with the U.S. Treasury.

Fannie Mae and Freddie Mac provide loanable funds to the housing sector by selling their own securities and using the proceeds to purchase mortgages or mortgage-backed securities in the secondary mortgage market. The securities that they issue are backed by the principal and interest payments on the mortgages or mortgage-backed securities that they have purchased. Before September 2008, Fannie Mae and Freddie Mac were privately owned and their stock traded on the New York Stock Exchange. When Fannie Mae and Freddie Mac were put into conservatorship, common and preferred stock holders lost even though those who had purchased the agency securities of Fannie Mae and Freddie Mac did not. The difference between Fannie Mae and Freddie Mac is that Fannie Mae primarily buys the mortgages of banks, while Freddie Mac primarily buys the mortgages of thrifts.

Congress created these GSEs in order to make housing more available by increasing the funds flowing into mortgages. The goal was to expand the opportunities for low- and moderate-income families to purchase houses. The U.S. Department of Housing and Urban Development (HUD) regulates these GSEs with regard to meeting this goal. In Chapter 21, we will discuss recent issues involving the demise of Fannie Mae and Freddie Mac.

Government National Mortgage Association (Ginnie Mae)
A government-owned enterprise that, for a fee, gives an explicit government guarantee that Ginnie Mae bonds issued by private financial institutions will be repaid.

The **Government National Mortgage Association (GNMA, or Ginnie Mae)** is a U.S. government-owned corporation within the Department of Housing and Urban Development (HUD). As part of HUD, Ginnie Mae is more accurately characterized as a government-owned enterprise. For a fee, Ginnie Mae guarantees that the mortgages purchased with bond proceeds will be repaid and, hence, the bonds will be repaid. Unlike Fannie Mae and Freddie Mac, Ginnie Mae does not issue bonds. Other financial institutions such as banks, savings associations, or mortgage brokers issue the bonds that are guaranteed by Ginnie Mae, referred to as *Ginnie Mae bonds.* The minimum denomination for Ginnie Mae Bonds is $25,000. Unlike Fannie Mae and Freddie Mac, Ginnie Mae securities have always been fully backed by the U.S. government and, thus, have had no default risk.

The GSE Farm Loan Market

Federal Farm Credit Banks Funding Corporation (FFCBFC)
A GSE that issues bonds and discount notes to make loans to farmers to increase the funds flowing into agriculture.

Farm Credit Financial Assistance Corporation (FACO)
A GSE that issues bonds to assist the FFCBFC, which was having financial problems at the time FACO was created.

The **Federal Farm Credit Banks Funding Corporation (FFCBFC)** issues bonds and discount notes and uses the proceeds to make loans to farmers in order to facilitate the funds flowing into agriculture. The bonds carry no explicit government guarantee that the principal and interest will be repaid. The FFCBFC ran into financial problems in the 1980s because many farmers defaulted on high-interest loans made in the late 1970s and early 1980s. Congress created the **Farm Credit Financial Assistance Corporation (FACO)** in 1987. FACO issues bonds and uses them to assist the FFCBFC. Unlike the bonds of the FFCBFC, FACO bonds do have an explicit government guarantee.

Other GSEs

Financing Corporation (FICO)
A GSE created in response to the S&L crisis that issued bonds to help shore up the FSLIC.

Resolution Trust Corporation (RTC)
A GSE created in 1989 in response to the savings and loan crisis that issued bonds and used the proceeds to dissolve or find buyers for the failed thrifts and their properties. The RTC went out of business on December 31, 1995, after completing its work.

In 1987, Congress created a new GSE, the **Financing Corporation (FICO),** in response to the savings and loan crisis. The savings and loan crisis was covered in detail in Chapter 16. FICO was to issue up to $10.825 billion in 30-year bonds to help shore up the insurance company (the FSLIC) that at the time insured deposits in the failed thrifts. FICO was capitalized by nonvoting stock purchased by the 12 regional Federal Home Loan Banks. It is to be dissolved by 2026 or earlier. FICO was not successful in bailing out the failed thrifts, so additional legislation and the creation of another GSE was needed.

In 1989, Congress created another GSE, the **Resolution Trust Corporation (RTC).** The RTC was to dissolve or find buyers for the failed thrifts and liquidate the $450 billion of real estate properties owned by the thrifts being dissolved. Thirty-year bonds were issued to help finance the RTC, but the federal government did not explicitly guarantee the bonds. The RTC went out of business on December 31, 1995, after it had completed its work. By that time, it had resolved the insolvencies and closed more than 750 savings associations. In the financial crisis of 2008, some have suggested that Congress should create a similar institution to deal with the abundance of foreclosed properties. The Emergency Economic Stability Act of 2008 failed to do so.

The Student Loan Market

Student Loan Marketing Association (Sallie Mae)
A former GSE, fully privatized in 2004, that issues securities to purchase student loans, thus increasing the funds flowing into student loans and making them more liquid.

The **Student Loan Marketing Association (Sallie Mae),** a publicly traded company, issues securities and uses the proceeds to purchase student loans. The securities are not backed by an explicit federal government guarantee. In fact, in 2004, Sallie Mae was fully privatized and is no longer officially a GSE. Despite this, the federal government guarantees repayment of many of the student loans. The purpose of Sallie Mae is to increase the funds flowing into student loans and to make student loans more liquid. The company, which is the nation's largest supplier of student loans, owns or manages student loans for more than 5 million borrowers.

Recap

GSEs are privately owned government-sponsored enterprises that issue financial securities. The funds that are raised are used to provide funds to areas that the government deems desirable, including housing, farm credit, and student loans. The major GSEs that pertain to the housing market were Fannie Mae and Freddie Mac. The FFCBFC issues securities and uses the proceeds to make loans to farmers. Congress created FACO in 1987 because of financial troubles of the FFCBFC. FICO and the RTC were created in response to the savings and loan crisis. Sallie Mae is a publicly traded company that issues securities and uses the proceeds to purchase student loans. Sallie Mae was privatized in 2004, while Fannie Mae and Freddie Mac were placed under conservatorship in 2008, so these three entities are no longer GSEs.

THE GROWTH OF FINANCIAL CONGLOMERATES

Financial Conglomerates
Firms that own and operate several different types of financial intermediaries and financial institutions on a global basis.

Financial conglomerates are firms that own and operate several different types of financial intermediaries and financial institutions. As a rule, they operate on a global basis. Financial conglomerates usually result from the mergers of several firms. For example, one financial conglomerate may own a commercial bank, a savings institution, a mutual fund, a pension fund, a securities firm, and an insurance company. The alleged advantages of forming financial conglomerates include taking advantage of economies of scale, economies of scope, and diversification.

The crisis of 2008, which drastically changed the financial landscape, appears to be hastening the formation of multifaceted conglomerates. The independent investment banking model seems fundamentally changed, with the five most notable independent investment banks either liquidated or merged with a commercial bank–based financial conglomerate.

Economies of Scale
Gains from bigness that may result from several firms being able to streamline management and eliminate the duplication of effort that would result from several separate firms.

Economies of scale, which are gains from bigness, may result when separate firms owned by a conglomerate and offering the same product are able to streamline management and eliminate duplication of effort. The conglomerate may have fewer boards of directors than if there were many separate firms. They may also share a common technology infrastructure.

Economies of Scope
Advantages to firms being able to offer customers several financial services under one roof.

Economies of scope refer to the advantages of a conglomerate's ability to offer several financial services under one roof. This one-stop shopping is supposedly an advantage to financial services customers and, hence, gives financial conglomerates the upper hand over several separate firms providing the same set of services. In addition, the subsidiaries can share information about customers and seek new customers from other subsidiaries.

Diversification
The branching out of financial conglomerates into several product lines to reduce the dependence of the conglomerates on any single product line.

Diversification refers to the branching out of the financial conglomerate into several product lines. Diversification reduces the dependence of the financial conglomerate on one service. This, in turn, reduces the risk of failure for the financial conglomerate. If one division is performing poorly, the conglomerate can still be earning a profit if other divisions pick up the slack. For example, if the credit card division is losing money, it can be subsidized by the insurance division for a while. If credit cards were the dominant product line of a financial services institution, losses in this area could affect the solvency of the institution. This is not so in the case of a financial conglomerate.

Financial conglomerates have been emerging in the financial world since the early 1970s. Some of the first attempts were started by nonfinancial giants, such as Sears, that bought financial subsidiaries. Not all of the early attempts met with success, particularly when a nonfinancial firm was purchasing financial institutions. For example, in 1981, Sears purchased Dean Witter Stock Brokerage and Coldwell Banker Real Estate, only to sell them in 1989 because of losses in these subsidiaries. Subsequently, Sears sold its remaining financial services, mainly its credit card division, to Citigroup. Sears merged with K-mart and formed Sears Holding Company in 2005. After an aborted attempt to transform itself into a financial firm such as Berkshire-Hathaway, it began to refocus on its retail operations.

Regulations dating back to the Glass-Steagall Act during the Great Depression attempted to prevent different types of financial firms from merging and providing a vast array of financial services. However, by the mid-1990s, many institutions were already finding loopholes in existing regulations in order to form financial conglomerates, and impetus was building to do so. In November 1999, Congress passed the Gramm-Leach-Bliley Act (GLBA), also known as the Financial Modernization Act. The passage of this law gave new impetus to the formation of financial conglomerates. The law effectively repealed Glass-Steagall and allowed for the formation of financial holding companies (FHCs). FHCs may

Citigroup

In 1998, Citicorp, the nation's second-largest bank holding company, announced that it would merge with Travelers Group, the parent company of Travelers Insurance and Salomon Smith Barney. Salomon Smith Barney (currently Smith Barney) was the nation's third-largest securities firm. Citigroup was on its way to becoming the quintessential financial conglomerate, operating globally and providing a vast array of financial services.

The 1998 merger occurred before the passage of GLBA and, in its present configuration, Citigroup would not be a legal entity if GLBA had not passed. Indeed, the Fed approved the merger in September 1998 with the understanding that Citigroup would divest itself of several banned services—such as insurance underwriting—within five years if Glass-Steagall were not repealed. But GLBA passed and the merger was consummated in October 1998. At that time, Citigroup had more than $700 billion in assets, more than 100 million customers, and a presence in more than 100 countries.

Citibank, which is owned by Citicorp, is the nation's second-largest bank. In addition to Citibank, Citigroup has nonbank subsidiaries that provide services such as investment banking; credit cards; global asset management; trust services; buying and selling stocks, mutual funds, and bonds for customers; consumer finance; commercial lending; mortgage banking; data processing; leasing; securities advising and management; and insurance services.

In 2000, Citigroup announced the purchase of Associates First Capital Corporation. The deal boosted Citigroup's consumer-oriented U.S. business lines and strengthened its international position. Three years later, Citigroup issued a credit card (together with Banamex) aimed at Mexicans living in the United States, bought a significant share of Shanghai Pudong Development Bank Co. Ltd., and through its subsidiary, ZAO Citibank, launched a new Russian credit card. In 2004, Citigroup acquired KorAm Bank, one of South Korea's largest commercial banks with 223 branches. It also purchased Washington Mutual Finance Corporation (from Washington Mutual, Inc.) and First American Bank of Texas. The next year, in 2005, Citigroup introduced a new debit card program in Egypt, mobile phone banking in Australia, financial services through post offices in Romania, and a dual-currency card in China. In 2006, it opened in Kuwait and Dubai; expanded equities operations in Russia, India, the Middle East, Brazil, and Canada; and acquired 20 percent stakes in Akbank in Turkey and Guangdong Development Bank in China.

In 2007, Citigroup's expansion and internationalization efforts were slowed by its massive U.S. mortgage market related losses. These forced CEO and chairman Charles Prince to resign. Vikram Pandit, formerly of the investment bank Morgan Stanley, is the current CEO.

The rationale behind the mergers and alliances was to take advantage of economies of scale and scope and diversification. Experts had forecasted that the Citicorp-Travelers merger would save at least $1 billion per year in expenses, but the actual results have been mixed. Citigroup stock suffered in the bear market of the early

2000s. Afterward, its stock price did better, rising to over $55 per share at the end of 2006. But more recently, problems associated with declining real estate prices and rising default rates punished Citigroup's 5.21 billion shares, so that by January 2009, they were trading around $10 a share.

own securities firms, banks, and insurance companies. They may also engage in ancillary financial and complementary nonfinancial enterprises. By March 2000, the effective date of GLBA, there were 111 FHCs; as of February 2008, there were 468.

Rather than maintaining the status quo of segmentation among financial service providers, the GLBA encourages considerable financial integration in the financial services industry and the formation of financial conglomerates. Many of these firms are transnational in that they offer a full range of financial services in many countries. "A Closer Look" on p. 498 discusses Citigroup, a financial conglomerate formed in 1998, before the passage of GLBA.

Since the 1990s, there have been three trends in financial markets: growth, consolidation, and globalization. These trends have been emphasized repeatedly throughout this text. We expect that these trends will continue in the future and that financial markets and institutions will be most influenced by these factors as they evolve. The financial crisis of 2008 seems to have encouraged the formation of financial conglomerates. For example, as a result of the crisis, Bank of America purchased Countrywide and Merrill Lynch; and Wells Fargo purchased Wachovia.

Recap Financial conglomerates operate several different financial intermediaries and institutions that provide an array of financial services on a domestic and global basis. They result from consolidation in the financial services industry due to economies of scale, economies of scope, and diversification. Passage of the GLBA encouraged the formation of financial conglomerates. The financial crisis of 2008 may result in the increase of financial conglomerates.

This completes our look at financial institutions. You should now have a better understanding of their evolution and current state. In the next section of the text, we will direct our attention to how financial risk is managed.

Summary of Major Points

1. Investment banks design, market, and underwrite the issuance of new securities in the primary market. The newly issued securities may be an IPO or a seasoned offering. In addition to advising the issuer about market conditions and prospective prices for the new securities, the investment bank also assists in filing the necessary reports with the SEC so that the new securities can be sold publicly. The securities may be stocks or bonds. A registration statement must be filed with the SEC. Part of the registration statement is the prospectus that will be distributed to investors. The SEC is concerned that appropriate information about the issuance is disclosed to the public.

2. Mutual funds pool the funds of many investors to invest in several hundred or even thousands of stocks or bonds. Mutual funds may offer greater safety and more diversification than investing in one or a few stocks. Mutual funds have experienced tremendous growth in recent years. Money market mutual funds invest in securities with an original maturity of one year or less.
3. An open-end fund continually sells new shares or buys outstanding shares from the public at the net asset value. Closed-end investment companies sell a limited number of shares that may be traded openly. The price is determined by supply and demand and can differ from the net asset value. The net asset value per share is the difference between the market value of the shares of stock that the fund owns and the fund's liabilities, all divided by the outstanding number of shares. Mutual funds can be either load or no-load funds.
4. Government-sponsored enterprises (GSEs) are corporations that are sponsored or chartered by Congress. Most GSEs are privately owned and privately managed. Some GSEs have issued shares of stock that are publicly held like other corporations. The stocks of these GSEs are traded on organized exchanges. GSEs issue short-term securities that sell at a discount and long-term bonds. The majority of the issuances are long term. The proceeds are used to assist in some aspect of lending that the federal government has deemed desirable. The major areas in which GSEs have operated are housing and farm credit, and student loans. The securities that GSEs issue have been called *government agency securities.* In 2008 the two largest GSEs, Fannie Mae and Freddie Mac, were placed under a conservatorship by the Federal Housing Finance Agency, FHFA.
5. In most cases, the federal government had no legal obligation to guarantee the timely payment of interest and principal of GSE securities. However, many market participants assumed that the government was the de facto guarantor of the payments. The yield spread between government agency securities and U.S. government securities reflected differences in liquidity and risk. In 2008, the federal government formally became the guarantor of debt issued by the two largest former GSEs, Fannie Mae and Freddie Mac.
6. Historically, a hedge fund is a type of mutual fund that has fewer than 99 very wealthy investors. In 1997, the number of investors was expanded to 499 for some hedge funds. The SEC does not regulate hedge funds. Hedge funds attempt to earn high returns for their investors regardless of whether financial prices are going up or down. Sometimes, hedge funds engage in risky investment strategies.
7. Real estate investment trusts (REITs) pool the funds of many small investors and use them to buy or build income property or to make or purchase mortgage loans. They are pass-through institutions in that the rents from the income property and/or the interest income from the mortgages are passed through to shareholders. At least 75 percent of the assets of REITs must be either real property (generally, commercial or industrial real estate) or mortgages. By law, REITs must return 95 percent of their earnings to shareholders each year. Shares of REITs are traded on organized exchanges like shares of stock.
8. Financial conglomerates are financial firms that provide an array of financial services that had been previously provided by several financial intermediaries and institutions. In theory, financial conglomerates offer economies of scale, economies of scope, and diversification. Changes in technology and regulations, as well as financial difficulties of stand-alone investment banks have given new impetus to the formation of financial conglomerates in recent years.

Key Terms

Asked Price, p. **484**
Bid Price, p. **484**
Bond Indenture, p. **481**
Broker, p. **483**
Closed-End, p. **487**
Dealer, p. **484**
Diversification, p. **497**
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Review Questions

1. What are the functions of investment banks? Do they engage in primary or secondary market activity? What is a syndicate?
2. What is a prospectus? What are the differences among a prospectus, a registration statement, and a bond indenture?
3. What is the difference between a securities broker and a securities dealer? What roles do brokers and dealers play in the financial system?
4. How does a hedge fund differ from a traditional mutual fund? What are the two types of hedge funds and how are their requirements for participation different? What is the difference between a mutual fund and a money market mutual fund?
5. Are investment banks financial intermediaries? Explain why or why not.
6. The spread between the bid and asked price widens. What does this mean about the securities?
7. What is the difference between a load and a no-load mutual fund? Could a no-load fund ever result in higher total sales commissions and costs?
8. Miguel expects a stock's price to rise. Should he short sell the stock? Explain.
9. What is the difference between a market order and a limit order? What are the two types of limit orders?
10. What type of securities do GSEs sell? What is the purpose of GSEs? Who owns the GSEs? What happened to the federal government guarantee of securities issued by Fannie Mae and Freddie Mac in 2008?
11. What are some of the factors for the growth of mutual funds in recent years?
12. List some reasons that Henry should consider purchasing a fund of funds. Are there any reasons he should not?
13. How do REITs differ from other mutual funds? Are all REITs pretty much the same? What are their differences?
14. What is a financial conglomerate? Discuss the factors that contribute to the formation of financial conglomerates.
15. How does diversification reduce the risk that a financial conglomerate will fail? What is the difference between economies of scale and economies of scope?

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

✓16. A mutual fund owns stocks with a market value of $1 billion and has liabilities of $1 million. What is the net asset value? If there are 2 million shares of stock outstanding, what is the net asset value per share?

✓17. What are some of the factors that determine the spread between the bid and asked price? If the bid-asked spread narrows, what does this mean?

✓18. What are the factors that determine the spread between agency securities and Treasuries? If agency and Treasury securities are perceived to have the same risk, why may there still be a positive spread between their prices?

✓19. Make a chart listing the similarities and differences among the following institutions: money market mutual funds, mutual funds, hedge funds, government-sponsored enterprises, and REITs.

✓20. Comment on the following: Frank calls his broker to complain that the stock the broker sold him has fallen in value and Frank has lost a lot of money. The broker says: "Look, I made money and the brokerage firm made money on the deal. Two out of three is not bad!"

Suggested Readings

Learn about the *Financial Industry Regulatory Authority (FINRA)* the largest nongovernmental regulator for all securities firms doing business in the United States (the successor to the NASD) by visiting their site at: **http://www.finra.org/AboutFINRA/CorporateInformation/index.htm.**

For information about investment banking and capital markets around the world, visit the site of Thomson Financial at **http://www.thomson.com/solutions/financial/.**

Learn more about GSEs at their Web sites: **http://www.freddiemac.com, http://www.fanniemae.com,** and **http://www.ginniemae.gov**. Other information on government-sponsored enterprises is available at the U.S. Department of Housing and Urban Development Web site at **http://www.hud.gov,** and the Office of Federal Housing Enterprise Oversight (OFHEO) Web site at **http://www.ofheo.gov/newsroom.aspx.** Recent changes to conforming loan limits are listed on the latter site at **http://www.ofheo.gov/media/hpi/AREA_LIST.pdf.**

For more on the former GSE, Sallie Mae, go to **http://www.salliemae.com.**

To learn more about mutual funds from the perspective of those who sell them, go to the Investment Company Institute site at **http://www.ici.org** and their 2007 Factbook at **http://www.icifactbook.org.**

For a discussion of exchange-traded funds (ETFs) and their benefits relative to mutual funds, see "Better Than Beta?" in *The Economist*, February 28, 2008.

For an academic view of hedge funds, read "Hedge Funds: Past, Present, and Future," by Rene Stulz in *The Journal of Economic Perspectives*, 21, no. 2 (Spring 2007).

The Federal Reserve Chair, Ben Bernanke, addressed the regulation of financial firms in a speech given May 15, 2007, accessible at **http://www.federalreserve.gov/newsevents/speech/bernanke20070515a.htm.**

To learn about Google's August 2004 Initial Public Offering, see the following articles in *Business Week:* "The How and Why of Google's Auction," May 3, 2004; "The A-B-Cs of Google's Auction," August 10, 2004; and "The Google IPO Marches On," August 13, 2004. Additional information is available in articles in *The Economist:* "A Cartel-Buster," May 6, 2004, and "Google's IPO Rollercoaster," August 20, 2004.

For a look at government-sponsored enterprises from an educated point of view, see the testimony of former Fed Chairman Alan Greenspan on government-sponsored enterprises before the Committee on Banking, Housing, and Urban Affairs, U.S. Senate, February 24, 2004. A transcript of the testimony is available online at **http://www.federalreserve.gov/boarddocs/testimony/2004/20040224/default.htm.**

For a recent overview of some issues relating to mutual funds, see John B. Carlson, Eduard A. Pelz, and Erkin Y. Sahinoz, "Mutual Funds, Fee Transparency, and Competition," *Economic Commentary*, Federal Reserve Bank of Cleveland (March 1, 2004), available online at **http:// www.clevelandfed.org/Research/Commentary/2004/03–01.pdf**.

For an engaging article on "Why We Do What We Do: The Views of Bankers, Insurers, and Securities Firms on Specialization and Diversification," see the panel discussion summary by the same name by Kevin J. Stiroh. The discussion session featured Tony Candito, Michael J. Castellano, and Richard Heckinger as presenters, and Darryll Hendricks as moderator. Stiroh's summary is available in *Economic Policy Review*, Federal Reserve Bank of New York, 6, no. 4 (October 2000): 81–87, and online at **http://www.newyorkfed.org/research/epr/00v06n4/0010stir.pdf.**

For a discussion of many of the topics in this chapter, see Dimitri B. Papadimitriou, ed., *Modernizing Financial Systems* (London and Basingstoke: Macmillan/St. Martin's Press, 2000).

For a historical look at the securities industry at a time of dramatic change, see Alec Benn, *The Unseen Wall Street, 1969–1975* (Westport, CT: Greenwood Publishing Group, 2000).

For a discussion of the size, number, behavior, regulation, and policy implications of hedge funds, see Barry Eichengreen and Donald Mathieson, "Hedge Funds: What Do We Really Know?" *Economic Issues*, International Monetary Fund, 19 (September 1999).

Endnotes

1. What the firm was doing would not have been illegal as long as there was no connection between the corporation issuing the stock and the securities firm. However, in reality, J.T. Marlin was undoubtedly committing many other acts of securities fraud.
2. Data are from the *2008 U.S. Statistical Abstract*, Table 1138; and *Flow of Funds Accounts of the United States, Z.1*, Board of Governors of the Federal Reserve System (March 6, 2008).
3. The Glass-Steagall Act of 1933 separated investment banking from commercial banking. As you have seen, this act was effectively repealed in 1999 with the passage of the Gramm-Leach-Bliley Act (GLBA). The passage of the GLBA is partially responsible for the emergence of financial conglomerates discussed later in this chapter.
4. With the Vanguard STAR Fund, Vanguard waives the fund of funds fee so that investors pay only the fees of the individual mutual funds.
5. As used here, *hedge fund* means any kind of private investment partnership. The most common meaning of *hedge* is to reduce risk. This can be misleading because hedge funds often engage in very risky activities.
6. The tax consequences include that net losses cannot be used to offset gains and that deferred interest payments are taxable in current years and investors are often not provided the information by the hedge fund that would allow them to make current tax payments and to avoid tax penalties. Offshore hedge funds are easily available to a small number of tax-exempt wealthy U.S. investors.

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PART 6

Managing Financial Risk

21 Financial Instability and Strains on the Financial System

22 Risk Assessment and Management

23 Forward, Futures, and Options Agreements

24 Asset-Backed Securities, Interest Rate Agreements, and Currency Swaps

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CHAPTER TWENTY-ONE 21

The advantage of a bad memory is that one enjoys several times the same good thing for the first time. —Friedrich Nietzsche

If you get into anybody far enough, you've got yourself a partner.

—Failed-then-jailed Texas Wheeler Dealer Billie Sol Estes

Financial Instability and Strains on the Financial System

Learning Objectives

After reading this chapter, you should know:

The ways in which financial intermediaries (FIs) deal with risk and why risk cannot be eliminated

What a debt deflation is and why it is so onerous

Why financial intermediation recurrently leads to financial instability and financial crisis

What the moral hazard problem is and how it may exacerbate financial crises

The causes of the great financial crisis of 2008

Other potential causes of future financial crises in a globalized financial system

MEMORY IS THE THING YOU FORGET WITH[1]

In the 1920s, Charles Ponzi, a Boston financier (or slick con man), convinced people that he was able to make huge sums of money by arbitraging Spanish postage stamps—that is, by buying the stamps in a low-cost market (Spain) and selling them in a high-cost market (Boston). The large difference between the selling price and the buying price would result in a capital gain.

Unfortunately for investors, instead of making capital gains, Ponzi was using the money enticed from new investors to pay off the high profits early investors had anticipated. Inevitably, people lost faith in his capability to pay off their investments, and Ponzi's empire collapsed as he became unable to attract new investors. Later, Ponzi engaged in a land scheme—selling swampland in Florida—that also eventually collapsed.

In the late 1990s, prices of Internet stocks increased exorbitantly in what came to be known as the "dotcom" bubble or fiasco, depending on how one looked at it. Small Internet companies launched initial public offerings (IPOs), selling newly issued shares of stock to the public for the first time. Investors fought to grab up stocks such as pets .com and etoys.com. Rumor had it that a company could just add "dotcom" to its name to see its stock soar. Companies without a product or any assets were snatched up in what was clearly a stock market frenzy. Technology became the latest hype, and the technology-laden NASDAQ composite stock index (a measure of the performance of technology stocks) increased about 525 percent in the five-year period from 1995 to 2000. The dotcom and other technology stocks were clearly in a stock market bubble. The bubble burst in early 2000, and the NASDAQ index gave back about 90 percent of the previous five-year gain over the next two and a half years. Internet companies failed, employees lost their jobs, and the paper wealth of investors in the dotcoms was destroyed. All of these factors contributed to the recession of the early 2000s. By late 2008, the NASDAQ was still about a third of its previous high in March 2000. The stock market bubble was not isolated to technology stocks, however. Broader stock markets were also caught up in an irrational bubble, but not as much as the NASDAQ. The bursting bubble encompassed global as well as domestic stock markets. Fortunately, however, it did not spread to other financial markets or institutions.

Although the early years of the new century were not good for stocks, they were good for the housing market. With interest rates driven to 45-year lows in response to the collapse of stock prices and the terrorist attack on the United States on September 11, 2001, housing prices soared into an unsustainable housing price bubble. The soaring prices caused many homeowners to take out large mortgages that they could not afford or could afford only if housing prices continued to soar. Lending standards were reduced so that even borrowers with low down payments and questionable credit scores could obtain mortgage loans. Many of the mortgages were made with adjustable "teaser" rates that would readjust sharply upward in a few years. Borrowers were confident that housing prices would continue to soar and that they could refinance at lower rates before the higher rates kicked in. They did not want to miss the opportunity to make a bundle in the housing market or to get a "piece of the American dream." Housing prices reached unsustainable levels relative to household incomes. Again, the housing boom was global in nature, with most developed countries seeing soaring prices in the early 2000s. The bubble peaked in 2006 and began to burst in 2007. Many homeowners saw severe decreases in their home prices, with the result being that they owed more on their mortgages than what their houses were worth; they were unable to afford the higher payments caused by the adjustable rates and could not refinance because they owed more than the total value of their property. A considerable amount of homeowners were left with few options other than to default on their home loans; mortgage lenders and other financial intermediaries

suffered severe losses and went bankrupt, triggering a financial crisis in the mortgage market. Unfortunately the crisis in the mortgage market was not contained but spread to broader financial markets and the financial system at large. By September 2008, the financial system was caught in an unprecedented crisis. Policy makers feared a global collapse of the financial system which would have devastating effects on the economy. What began as excessive risk taking in the housing and mortgage markets spread to all domestic and global financial markets and threatened the entire global economy. Like all financial crises, the root cause was excessive risk taking. However, the crisis was compounded by the huge amount of leveraging and the explosion of complex derivative and securitized assets in a global economy. Although Band-Aid solutions were tried from August 2007 on, policy makers came to the conclusion that a comprehensive government bailout was needed. Congress passed and the president signed a $700 billion bailout plan on October 3, 2008. The Obama administration promised an even bigger bailout in early 2009. How long it will take for the economy to recover from this crisis remains to be seen.

How different were the financial institutions and individuals who participated in the housing bubble of the early 2000s from those who fell victim to the Ponzi scheme in the 1920s or the dotcom bubble of the late 1990s?[2] Perhaps they were really not all that different in their desire for a big payoff, their willingness to take a risk to achieve it, and their refusal to realistically evaluate that risk. Perhaps such behavior is part of human nature and hence endemic to financial institutions controlled by individuals.

In this chapter, we look at some of the reasons that strains and instabilities have recurrently plagued our financial system. We look at the role of moral hazard in causing financial crises. Finally, we will examine some famous and some not-so-famous stresses that have led to financial crises. If we better understand the causes of financial instability, we can better grasp the tools with which financial market participants use to manage and assess the risks of instability.

FINANCIAL INTERMEDIATION, RISK, AND FINANCIAL CRISES

You have seen that FIs have developed numerous ways to manage risk. For example, diversification reduces the risks of insolvency from widespread defaults in one sector or region of the economy. By not putting all of their eggs in one basket, FIs are less likely to run into problems. Another factor that reduces credit risk is the use of experts to evaluate and assess the creditworthiness of potential borrowers and potential investments. In recent years, credit derivatives that we discussed in Chapter 15 have also been used to mitigate credit risk.

Interest rate risk can be reduced through the use of adjustable rate (also called variable rate) loans or the judicious use of forwards, futures, options, and swap agreements, and securitizations. Coping techniques have become more refined as interest rates have become more erratic.

Forwards, futures, options, and swap agreements are also used to hedge exchange rate risk. In recent decades, foreign exchange rates have become more volatile, and finance has become more globalized. Both factors have caused this risk to increase significantly. Thus, we have seen the growing use of these agreements to hedge exchange rate risks. Forwards, futures, and options are the subject of Chapter 23.

In addition to borrowing funds from the Fed, depository institutions can rely on their ability to borrow nondeposit liabilities to meet liquidity needs. If liquidity is needed, funds can be purchased in the repurchase agreements, fed funds, or Eurodollar markets. This ability to borrow reduces the liquidity risk. Depository institutions can also issue new negotiable certificates of deposit. In a liquidity squeeze, all FIs can sell any available liquid assets in secondary markets.

Even though strategies to reduce risks are significantly developed and appear comprehensive, risk is impossible to eliminate because the future is highly uncertain. Risk is simply an inherent part of life. If an FI makes loans or purchases financial assets that involve only little or no apparent risk, it is passing up opportunities for profit. A relationship between a borrower and an FI that is established today may continue far into the future. The future circumstances the borrower and the FI find themselves in, however, may be far different from what they anticipated. What seems a sure bet today may turn out to be anything but that. Besides, if the entire economy collapses, even the most conservative FI is bound to see the value of its assets fall.

Risk is particularly acute and intensified in financial claims because payments from one party to another usually depend on a payment from a third party. For example, to make her house payment to the mortgage broker, Sally depends on receiving her paycheck from her employer. To pay the investor, the mortgage broker depends on getting the house payment from Sally, and so it goes. Financial claims are layered and depend on multiple parties fulfilling contracts or making payments that depend on still others fulfilling contracts. A default by one party sets off a chain reaction that can trigger multiple defaults. The more heavily spending units depend on payments from others, the greater the risk that a random default will lead to multiple defaults. Multiple defaults can lead to the freezing up of financial markets where lenders and borrowers no longer trust each other and lending dries up. What began in financial markets now spreads to "Main Street," as small businesses can no longer get loans to stay in business and consumers can no longer get loans to buy cars, etc. Workers are laid off, retirement accounts and wealth falls, and the situation further deteriorates.

Because of its very nature, the financial system will be chronically plagued by various strains, some of which will lead to multiple defaults and a financial crisis. We define a **financial crisis** as a critical upset in a financial market(s) that is characterized by sharp declines in asset prices and the default of many financial and nonfinancial firms.

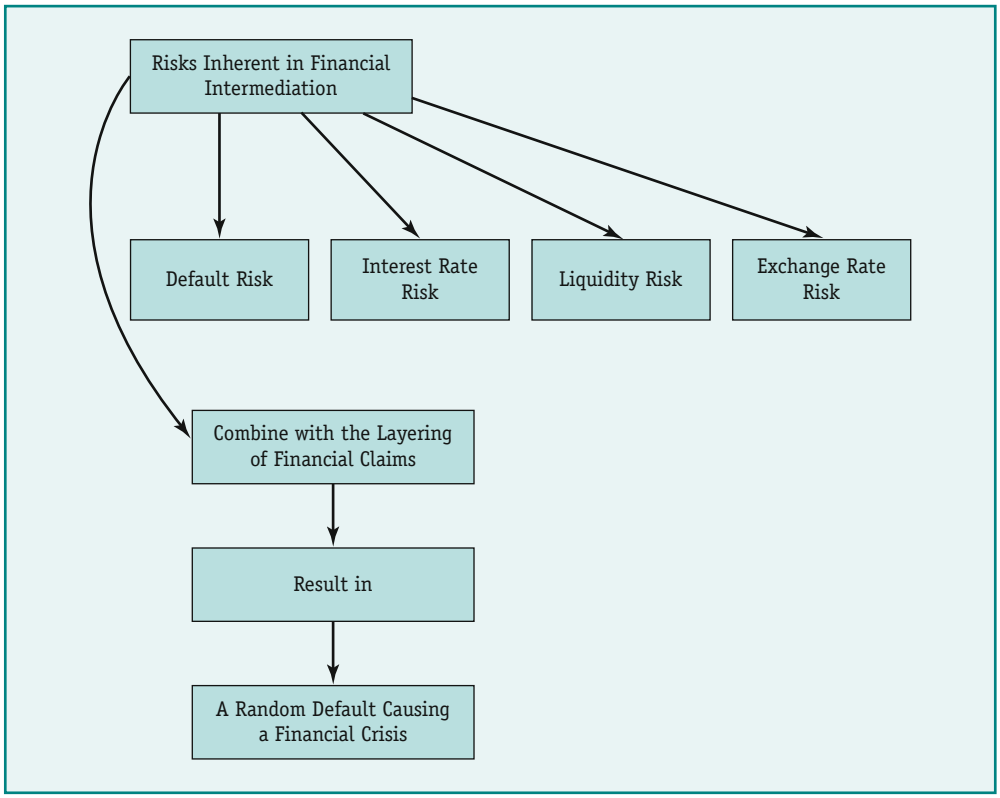
Financial Crisis
A critical upset in a financial market(s) characterized by sharp declines in asset prices and the default of many financial and nonfinancial firms.

Financial crises have occurred in the distant past (the Ponzi scheme) as well as the recent past (the dotcom and mortgage market crises). They will occur in the future. Like the business cycle, periods of severe strain are recurrent but not periodic. That is, they recur through time but not on a particular time schedule. Sometimes, long periods of time pass with no major strains; at other times, periods of stress occur very close together. Financial stresses vary in their severity. Sometimes, strains are isolated in one market, and other times they spread throughout the entire domestic and global financial system. The financial crisis of late 2008 is like the latter in that it burgeoned to threaten the entire system. When a crisis threatens the entire financial system, it is imperative for policy makers to seek a resolution to the crisis because of the deleterious effect of such a crisis on the economy. This is the reason for the unprecedented $700 billion Congressional bailout of the financial system in late 2008. Exhibit 21-1 depicts the anatomy of a financial crisis.

Many interrelationships exist. For example, a general slump in the economy can create a financial crisis. One party defaults because of a downturn in the economy and sets off a chain reaction of defaults. The financial crisis worsens the existing downturn and can result in a deep recession or depression. At other times, the causation may flow in the opposite direction. In this case, a financial crisis, such as a dramatic fall in stock prices or a random large bankruptcy that causes a chain reaction of defaults, leads to a general slump in business activity or a recession.

Many different factors may increase the probability of a financial crisis. First, for example, a sharp and unexpected rise in interest rates increases the likelihood of multiple defaults. Increases in interest rates raise the monthly payments of borrowers with variable rate loans. Payments may be going up at the same time the value of the assets

21-1
The Anatomy of a Financial Crisis



such as houses that the borrowed funds were used to purchase are falling. For business firms that rely on short-term borrowings to fund inventories, costs will increase and, hence, profits will fall. Eventually, declining profits could lead to losses, reduced borrowing, and insolvency. For financial institutions such as banks that may rely on short-term borrowings or deposits to fund longer-term assets such as loans or mortgages, costs go up because of the higher interest rates that must be paid. At the same time, the value of the longer-term assets goes down. (Remember the inverse relationship between interest rates and the value of long-term fixed rate assets.) Moreover, when interest rates are rising, the most cautious borrowers will drop out of the market, postponing the investment or the large purchase until the future appears more certain. At such times, the adverse selection problem increases; that is, the pool of potential borrowers becomes more heavily weighted toward the less desirable borrowers—those who are more willing to take risks and have less secure financial positions.

Second, a fall in stock prices can set off a chain of events that increases the likelihood of a financial crisis. A fall in stock prices makes it more difficult for firms or individuals to borrow. Lower stock values reduce the net worth of firms, households, and stockholders. The value of possible collateral falls, the profit outlook dims, and potential borrowers appear less creditworthy. Households spend less because the falling stock prices have made them less wealthy. FIs may be hesitant to lend, given the new circumstances and the less certain future. Third, a fall in housing prices can set off a financial crisis in mortgage markets. If housing prices fall enough, homeowners will owe more than what their property is worth. Homeowners who find themselves in this position may walk away from their mortgage loans, leaving the lender holding the bag. The

lender may try to sell the property, putting more downward pressure on housing prices, leading to more defaults on mortgage loans. The crisis in the mortgage market can spread throughout the entire economy, as homeowners see the wealth they had accumulated in their houses fall and thus reduce their spending. Also, if many lenders go bankrupt because the loans they have made are not paid back, job and income losses also negatively impact the economy.

Deflation
The falling of overall price levels.

Debt Deflation
A real increase in debt burdens caused by falling incomes and prices and debt burdens that are denominated in dollars.

Fourth, unanticipated declines in the overall level of prices **(deflation)** can intensify the risk of a financial crisis. When prices fall, businesses make less profit and consequently tend to pay workers less, causing incomes to fall as well. Deflation imposes many onerous burdens. One of these is debt deflation. A **debt deflation** is a real increase in debt burdens caused by falling incomes and prices. For example, assume we are in a "typical" period of general deflation in which both prices and incomes are falling. If I have a $1,000 per month house payment on a house I paid $100,000 for when I was making $40,000, and my income and the value of the house falls to $20,000 and $50,000 respectively, I am experiencing debt deflation. My income and the value of my house have been cut in half, but my house payment is still the same. In real terms, my house payment has doubled. Because my income and other prices have fallen, my real debt burden has increased, even though my nominal debt payment ($1,000 per month) has not changed. Individuals in such a situation cannot afford their house payments, so they try to sell assets—just as everyone in a similar situation also tries to sell. With the market glutted and prices falling, there probably are not many buyers, leading to further price declines and a downward spiral. Lenders move in and foreclose, individuals declare bankruptcy, and prices fall even further. Needless to say, the mood in the economy becomes highly pessimistic. This example is somewhat exaggerated, but you get the picture.

Businesses are caught in a situation similar to that of individuals. Businesses can't repay debt on inventories as the value of inventories drops below the amount of debt contracted to purchase them, the value of finished goods drops below the amount of debt contracted to purchase raw materials, and so on. As businesses contract, employment and incomes decline, and the economy continues in a downward spiral.

If the frequency of foreclosures and bankruptcies accelerates, which it usually does in a deflation, a debt deflation is under way, and losses for bad debts mount at FIs, potentially leading to their collapse. Fortunately, periods of deflation were not "typical" during the middle and late twentieth century. Not since the Great Depression has the United States experienced widespread debt deflation in which thousands of banks failed in response to a scenario similar to the one just described. The Depression prompted the government to put into place safety nets such as the Federal Deposit Insurance Corporation (FDIC) and the Federal Savings and Loan Insurance Corporation (FSLIC).[3] Eventually, in a deflation, when prices fall to low levels, the seeds of recovery are planted as buyers scrape together enough funds to start buying again at the depressed prices. In reality, this occurs when both input and output prices have adjusted to profitable terms of trade.

In the early years of the 2000s, the Fed feared the return of deflation. Because the costs of deflation are potentially so high, the Fed acted aggressively to ward off even the slim possibility of it. As the Fed implied, the costs of inflation and deflation are not symmetrical in that the effects of deflation are potentially more destructive to the economy than the effects of a comparable amount of inflation.[4] Thus, the Fed drove interest rates to 45-year lows and held them there until the fear of deflation abated. The low interest rates fueled another crisis in the mortgage market that resulted from the bursting of the housing price bubble. As noted earlier, unfortunately, the mortgage crisis was not contained to the mortgage market but spread to other financial markets in what may be the greatest financial crisis and bailout in history. In early 2009, many analysts again were fearful of an oncoming deflation and this added to the urgency for policy makers to act.

Finally, in recent years, many financial crises have been global in nature, with a crisis in one country quickly spreading to others in the region and beyond. The growth in world trade, the removal of barriers to capital flows, and the increase in capital flows among nations has increased the likelihood of a financial crisis in one country spreading to other interdependent economies. Technology has exacerbated the problem in that hybrid financial claims are much more fungible due to advances in computer and information technologies. The risks of financial intermediation are magnified in a world of sophisticated global electronic funds transfers. Funds can move in and out of markets instantaneously, causing widespread losses and gains in various markets. The Mexican peso crisis of 1994, the Asian crisis of 1997–98, the 1998 crisis in Russia, and the 2001 crisis in Argentina are examples of financial crises in which the sudden and massive withdrawal of funds from the affected regions exacerbated the underlying causes of the crises.[5] Likewise, the extent to which global financial markets were intertwined with the subprime mortgage meltdown of 2007–2008 caught many analysts by surprise. Such fungibility of funds further contributes to financial instability. Now would be a good time to read the accompanying "A Closer Look" on the great financial crisis of 2008 and a theory of financial instability.

Consequently, because of the inherent risks of financial intermediation, a goal of regulators is to ensure the safety and soundness of the financial system. They do this in several ways, including creating a safety net for depositors (and possibly other investors). At the same time, regulators from various countries and international financial organizations are working together to establish guidelines and criteria for countries that wish to participate in the international financial system. They hope to increase international financial stability and to reduce the incidence of international financial crises. A secondary effect of these efforts, both domestically and globally, however, may be to encourage behavior that actually makes the system more prone to financial crises. We now turn to the problem of moral hazard, which can result in excessive risk taking.

Recap

A financial crisis is a critical upset in a financial market and is characterized by sharp declines in asset prices and widespread defaults. Financial crises occur from time to time because of the inherent risks in financial intermediation and because financial claims are layered. A debt deflation is a real increase in debt burdens caused by falling prices and incomes, leading to a downward spiral of foreclosures and bankruptcies. Financial crises can be triggered by sharp increases in interest rates, falls in stock prices, falls in home prices, or unanticipated decreases in the overall price level. A financial crisis in one economy can spill over to other economies. This effect is increased as economies become more interdependent due to the growth and fungibility of financial flows among countries.

THE PROBLEM OF MORAL HAZARD IN FINANCIAL INTERMEDIATION

The most severe financial crisis this country has ever experienced occurred during the Great Depression. During this period, which predated deposit insurance, more than one-third of the banks in the United States failed. To halt a series of bank runs in early 1933, President Franklin D. Roosevelt proclaimed a "bank holiday," shutting down all of the banks in the nation for one month. During this month, Congress passed the Glass-Steagall Act, which, among other reforms, established deposit insurance and created the Federal Deposit Insurance Corporation (FDIC). For the first time, small depositors did not have to worry about losing their deposits if their bank went belly-up. Soon, deposit insurance became available for small depositors in almost all depository institutions.

The Great Financial Meltdown of 2008

In the early 2000s, the housing market experienced an unprecedented boom as reflected in housing prices that increased nationwide and even worldwide. In many areas, housing prices roughly doubled in a five-year period. Part of the boom was caused by record low interest rates in the years following the dot.com bust and the terrorist attack on the World Trade Center on September 11, 2001. Part was caused by Congress that designed policies to increase homeownership among low income families.[a] In addition, innovation within the mortgage market also played a part. Two major innovations included the Alt-A (stated income) mortgages and **subprime mortgages.**

Subprime Mortgage
A mortgage loan made to a borrower with bad credit and little or no down payment.

Alt-A (Stated Income) Mortgage
A mortgage loan made to a borrower with good credit where the lender does not verify the income stated by the borrower.

Alt-A mortgages were designed for borrowers with good credit who could not document or verify their income. Alt-A loans were made at higher interest rates than loans where income was fully documented and verified. Many observers felt that these types of loans were over-used and abused by borrowers who were overstating their incomes and less able to afford the payments on their loans than they claimed. Why, after all, would anyone pay the higher interest rate if they could document their income? The problem is accentuated if the interest rate is adjustable and, at a later date, interest rates and payments rise.

Subprime loans were an even worse innovation. Buyers with low credit scores and little or no down payments were given loans, often at low introductory (teaser) rates that would later escalate. When the introductory rate period ended (usually after a year or two), the loans would rise to very high rates to compensate the lender for the greater risks of the loans. This is a classic example of a Ponzi scheme. Borrowers could come out ahead only if property values continued to rise and they could borrow more to pay off current loan balances. Some loans even involved negative amortization, where the borrower ended up owing more at the end of the year than the original loan balance.

By 2006, the party abruptly ended as borrowers started defaulting at alarming rates, lenders were bankrupt, housing prices collapsed, mortgage lending evaporated, and many politicians were seeking some form of bailout for distressed borrowers. The crisis caused major problems not only for homeowners but for investors and financial institutions as well. Financial institutions that were holding large amounts of the worthless loans were experiencing strains as the value of their assets deteriorated. Many of the subprime loans had been pooled together to create new mortgage-backed securities that were sold to investors and other financial institutions. The new securities were backed by the payments on the subprime mortgages, many of which would not be made.

By late 2007, the crisis had already caused a slowdown in the U.S. economy and was beginning to spread beyond the mortgage markets. By early 2008, it was estimated that about 10 percent of all homeowners had negative equity in their homes, meaning they owed more than what the homes were worth. Such a situation encourages borrowers who run into problems to abandon their homes to foreclosures rather than trying to find ways to hold on to them. As lenders foreclose, more properties are

vacant and deteriorating at a time when buyers are hesitant to jump into the market and funds for new mortgages are scarce. By the summer of 2008, a series of unprecedented collapses of financial institutions began that culminated in a massive government bailout of a financial system that was imploding. What started with innovation in the mortgage market ended with financial markets on the brink of collapse and the greatest government bailout in history. Below is a timeline that outlines some of the events that led up to the crisis and mammoth government bailout.

The Time Line Leading to the Financial Crisis of 2008

- In 2003–2006, many lenders offered subprime and Alt-A mortgages with low "teaser" rates. Borrowers would not be able to afford the payments when the rates reset higher in a few years. Many borrowers either did not know this or were relying on property values to continue to increase so that they could refinance at lower rates or, at worst, they could resell the homes for a profit.
- A massive housing price bubble peaked in July 2006. Nationwide, prices had more than doubled between January 2000 and mid 2006. Other areas of the country experienced even much greater increases.
- In early 2007, many subprime lenders went bankrupt, as borrowers could not afford to make the higher payments and were unable to refinance because they owed more than what their homes were worth. This had ripple effects on Wall Street and around the world because many of the "toxic" loans had been securitized into complex financial instruments and sold globally.
- In March 2007, Fed Chair Ben Bernanke believed the crisis could be contained in the subprime market.
- In April 2007, New Century Financial, the nation's second largest subprime lender declared bankruptcy.
- In June 2007, housing prices experienced their first nationwide year-over-year decline since 1991. Neighborhoods across the country were becoming dotted with abandoned, foreclosed, and deteriorating homes.
- In August 2007, Ameriquest Financial, once the largest maker of subprime loans, went out of business.
- In September 2007, the Fed, for the first time in four years, began cutting interest rates, in what would be dramatic decreases over the next seven months.
- In October 2007, the Dow Jones Industrial Average, an index of stock prices, closed at an all time high. Treasury Secretary Henry Paulson warned that the housing crisis posed a significant risk to the economy.
- From late 2007 through September 2008, the Fed created several special lending facilities that extended the size and scope of Fed lending. Lending was extended to primary dealers in addition to depository institutions. (These lending facilities were discussed in Chapter 10.)
- In January 2008, a struggling Countrywide Financial was bought by Bank of America. Home sales fell to their lowest level in 25 years and prices continued to plummet.
- In February 2008, Congress passed and the President signed a stimulus plan to get the economy out of the doldrums by giving tax rebates to most households.
- On May 30, 2008, the Treasury arranged the sale of Bear Stearns, one of the five dominant investment banks, to J.P. Morgan for $10 a share, sweetening the deal with an unprecedented $29 billion loan from the Fed.

- On July 11, 2008, the FDIC seized IndyMac Bank in what was the second largest bank failure to date. Depositors with uninsured deposits (those over $100,000 in regular accounts or $250,000 in retirement accounts) lost uninsured deposits. Shareholders and other debtors were virtually wiped out. Initial cost estimates to the FDIC are $4 to $8 billion.
- On September 7, 2008, the federal government announced that it would take over Fannie Mae and Freddie Mac, the large government sponsored enterprises associated with the housing market. Together, Fannie and Freddie controlled over half the mortgages in the country and had over $5 trillion of government agency securities outstanding.
- On September 14, 2008, Bank of America announced the purchase of Merrill Lynch, another of the "big 5" investment banks, to prevent its collapse.
- On September 15, 2008, Lehman Brothers, the oldest (158 years) "big 5" investment bank filed for bankruptcy.
- On September 18, 2008, the Fed set up a rescue plan for American International Group Inc. (AIG), the world's largest insurance company. The Fed injected $85 billion into the company in exchange for approximately 80 percent ownership. The Fed virtually nationalized the insurance company to prevent its bankruptcy.
- Also on September 18, 2008, the Fed along with other central banks injected $180 billion into the financial system to shore up liquidity. The Dow Jones Industrial Average droped to 33 percent below the October 2007 all-time high.
- As of September 19, 2008, the Securities and Exchange Commission (SEC) outlawed the short selling of the stock of many of the largest financial firms at least through October 2, 2008, in an attempt to stabilize prices. The SEC believed that short selling exacerbated the price drops of financial stocks.
- On September 21, 2008, the Fed approved the conversion of Goldman Sachs and Morgan Stanley (the last two seminal investment banks) to bankholding companies. The conversion to the bankholding company status gave the firms greater access to borrowing from the Fed. The era of the large independent investment banking firm (separate from the commercial banking institution) that began in the Great Depression was effectively over.
- On September 24, 2008, money market mutual funds started to experience "runs" as panicked depositors withdrew funds. Interbank lending dried up and the Fed announced the creation of another emergency lending facility to provide liquidity to the markets. Financial markets were freezing up. The need for large scale action by the government became more imperative to prevent a total financial meltdown that would have disastrous effects for the global economy.
- On September 25, 2008, after a run on deposits, regulators seized Washington Mutual, which was the sixth largest banking organization and the largest savings and loan in the country. Washington Mutual was put into receivership with the FDIC. Most of the assets and liabilities were then sold to J.P. Morgan for $1.9 billion. Shareholders and unsecured bondholders were expected to lose virtually everything. This was the largest bank failure in history.
- On September 24 and 26, 2008, the Fed engaged in massive concerted actions with other central banks to inject massive funds into a teetering global financial system. In total since the crisis began, $290 billion of swap agreements with other central banks were authorized.
- On September 25, 2008, Washington Mutual was sold to JPMorgan Chase in a transaction worked out by the Office of Thrift Supervision (OTS) and the FDIC.

- On September 28, 2008, Congress worked through the weekend to reach an agreement on an estimated $700 billion bailout package for the financial system before the Asian markets opened early on Monday morning. The Band-Aid solutions to date had not worked and global financial markets were in danger of freezing up totally. Such a situation would be catastrophic for the economy.
- On Monday, September 29, 2008, the House of Representatives rejected the package and financial markets went into a tailspin. The Dow Jones Industrial Average fell 777 points, the largest one-day point drop in history. Politicians fought to get compromise legislation worked out to reassure the public and to prevent the freezing up of financial markets.
- On October 3, 2008, Congress passed and the President signed the Emergency Economic Stabilization Act of 2008. Because of the $700 billion bailout, the government deficit in 2009 could exceed $1 trillion. The Treasury was authorized to purchase up to $700 billion of "toxic" mortgage-backed and other securities in order to provide funds to intermediaries so that they could resume lending and prevent deterioration of the economy. Initially, a large part of the bailout funds were used to inject capital into the nation's largest banks rather than to buy "toxic" securities.
- In January 2009, the Obama Administration was working on a new, bigger bailout plan as the economy continued to deteriorate.
- After the bailout, turbulence is expected to continue in financial markets for at least the next several months and many more financial institutions are expected to fail. Policy makers and the population at large hope that the freefall of the financial system can be stopped and that the spillovers to the real economy in the form of a deep and long-lasting recession can be averted.

Endnotes

a. See Russell Roberts, "How Government Stoked the Mania," *Wall Street Journal*, October 3, 2008. A11.

Moral Hazard
The reduction in market discipline experienced by FIs that goes hand-in-hand with deposit insurance.

Ever since the first deposit insurance statutes were enacted, there has been concern about the moral hazard problem that deposit insurance by its very nature causes.[6] In Chapter 4, we discussed moral hazard in terms of one borrower; that is, after getting the loan, a borrower may use the funds for a different, higher-risk project. In this chapter, the **moral hazard** problem refers to the reduction in market discipline experienced by FIs that stems from deposit insurance, a lender of last resort, and other practices of regulators.

Increases in moral hazard go hand-in-hand with deposit insurance. For example, deposit insurance encourages banks (and other FIs) to make riskier loans; depositors do not keep close tabs on how banks are managing their funds—at least not as close as they would if their deposits were not insured. Insured banks take more risks because greater risks offer the possibility of higher returns, and after all, banks are highly leveraged—they are risking depositors' funds, as well as their own, and they get to keep all the winnings. Furthermore, loan officers do not have to lie awake at night worrying about losses when the funds (deposits) are insured. Well-managed banks are penalized because they have to help pay the losses incurred by poorly managed banks.

Even in light of all these concerns, until the 1980s, deposit insurance was widely viewed as an incredible achievement.[7] Despite the reduction in market discipline that resulted from it, the 1933 statute that established the FDIC was probably one of the

A Theory of Financial Instability

Financial Instability Hypothesis
Hyman Minsky's theory that (1) the mixture of hedge, speculative, and Ponzi spending units in the economy determines the economy's predisposition to a financial crisis, and (2) after sustained periods of prosperity, spending units tend to take on more debt, which may in time lead to another crisis.

The financial instability hypothesis, developed by the late economist Hyman Minsky, refers to the natural tendency for the financial system to undergo periodic waves of crises and bankruptcies. The financial crisis can lead to a general economic decline because lending falls and businesses that rely on borrowing to maintain their general scope of operation deteriorate. During an extended period of prosperity, the seeds of crisis spontaneously germinate as lenders become too overconfident that loans will be repaid. This overconfidence causes them to make bad loans, which eventually result in defaults, a subsequent reduction in credit extension, and the possibility of system-wide collapse.

To understand Minsky's theory, we first consider the financial condition of spending units (firms and households) within the economy. Minsky argues that at any moment in time, the economy is composed of a mix of three types of spending units—hedge, speculative, and Ponzi units.

Hedge Spending Unit
A spending unit such as a household or firm where the anticipated revenues (inflows) significantly exceed the anticipated payment obligations (outflows).

A hedge spending unit is one where the anticipated revenues or incomes (inflows) significantly exceed the anticipated payment obligations (outflows). For example, a firm is a hedge spending unit if its normal or expected sales easily cover its costs, including loan payments to the bank, payroll, rent, and other expenses and, as far as we know, this situation is expected to prevail in the foreseeable future. A family is a hedge unit if its income is high enough to meet all of its debt payments, including mortgage, credit cards, car payments, etc. The likelihood of default or bankruptcy for a hedge unit is unlikely but possible if there is a sudden, unexpected drop in inflows.

Speculative Spending Unit
A spending unit in which the funds coming in may potentially fall short of the payment outflows if there is an increase in interest rates.

A speculative spending unit is one where the funds coming in may potentially fall short of the payment outflows if there is an increase in interest rates. For example, a firm that must refinance a loan or reissue bonds in the near future may find that its payment outflows could exceed inflows if interest rates have increased. Or a household with a variable rate mortgage and car payment may feel strapped if there is a sudden spike in interest rates resulting in payment increases. Speculative units have more uncertainty than hedge units, even though over a long period, it is anticipated that payment inflows will exceed payment outflows. For speculative units, outflows could go up with no increase in inflows. The hedge unit cannot be hurt if the interest rate goes up, but the speculative unit can be.

Ponzi Spending Unit
A spending unit that must continuously increase its outstanding debt to meet its current obligations or payments.

Finally, a Ponzi spending unit (named after the Charles Ponzi we met in the introduction to Chapter 21) must continuously increase its outstanding debt to meet its current obligations or payments. It is willing to do so, because it anticipates a bonanza at some date in the future which will more than make up for the increased level of debt. If at any time the spending unit is unable to increasingly borrow additional funds, it cannot meet current outlays. The financial managers of Ponzi spending units most likely have trouble sleeping at night, although we are not certain whether the subprime borrowers and lenders in the housing market in the early 2000s did!

According to Minsky, it is the mixture of hedge, speculative, and Ponzi spending units at large that determines the overall financial health of the economy. If the

economy is dominated by hedge spending units, then the underlying health of the economy is strong and the risk of widespread defaults and financial crisis is small. These spending units are not heavily dependent on the payments of others to meet their current payments.

On the other hand, if the economy is dominated by speculative spending units, the system is financially fragile and more highly dependent on borrowed funds. A random bankruptcy or an increase in interest rates can lead to more widespread defaults, which lead to more bankruptcies that can spread like wildfire throughout the economy.

Finally, if the economy is dominated by Ponzi units, bankruptcy is imminent unless these spending units can increasingly borrow additional funds. Under most circumstances, this seems highly unlikely. The degree of leveraging is extremely high. If for any reason spending units are unable to borrow additional funds, they default, leading to further defaults and widespread collapse. The greater this dependence is, the greater the potential for crisis. Spending units choose to become dependent enough on borrowed funds to become Ponzi units when a market (the stock market or the housing market, for instance) is in an irrational and exuberant bubble. Buyers are convinced that prices will continue to go up, no matter how unreasonable that may seem after the bubble bursts.

As suggested earlier, the enigma in the situation is that extended prosperity leads to an eventual collapse. As success continues, a growing number of spending units take on riskier—more leveraged—financial positions. Indeed, if expectations have been consistently substantiated in the past through the business expansion, there is no reason to suspect that they won't be validated in the future. The riskier or more highly leveraged position is actually rational behavior.

If households have not experienced a period of unemployment in several decades, then confidence grows, and they may increase their debt payments relative to their incomes, suspecting that their income flows will always continue. Why not buy the more expensive house your family can enjoy today and that will appreciate in the future? Likewise, firms are encouraged to increase their debt payments relative to inflows in the hopes of increasing profits. Why not expand operations using borrowed funds where you'll get to enjoy all the profits from that expansion? The longer the inflows meet or exceed the anticipated outflows, the greater this tendency becomes.

Debt-to-Income Ratios
The debt payments of spending units relative to their incomes or inflows.

Leveraging
The degree to which a spending unit relies on borrowed funds.

As a result of good times, spending units increase their debt payments to income ratios (**debt-to-income ratios,** for short). The economy as a whole moves into a more precarious and fragile position. **Leveraging** is the degree to which spending units rely on borrowed funds. With the degree of leveraging high, a random bankruptcy or a credit crunch—something that might go unnoticed in a hedge environment—can wreak havoc as the default of one unit leads to the default of another. A downturn is triggered and a domino effect pulls in the entire economy. The domino effect is not triggered if spending units are not highly leveraged.

Minsky believed that the boom-crises cycle repeats itself every 40 to 50 years. During a major downturn such as the one experienced during the Great Depression, widespread bankruptcies occur and there is massive deflation (falling prices) in real and financial assets. Lenders become unwilling to lend and borrowers become unwilling to borrow. Because credit extension is tightened, when the economy does begin to

recover, there is less debt than before the downturn and lenders are cautious about expanding debt or extending credit.

For several decades, spending units remember the downturn. Borrowers and lenders are unwilling to increase the amount of borrowing above very safe levels. Households and firms are not highly leveraged as spending units are cautious about taking outflows high relative to inflows. The economy is financially stable. But as all spending units increase their leveraging, the economy drifts to a less stable position. Lenders who refuse to go along with the increased lending will find that their market share is reduced and the downturn seems very far off, indeed.

At first, when a crisis occurs, the government may try one of several ways to prevent the downturn. The most prominent way is for the Fed to act in its role of lender of last resort or to simply supply liquidity through increasing reserves to the banking system. If the Fed intervenes swiftly and strongly, the downturn can be prevented. The original default can be limited to one area or sector of the economy.

Although Fed (or the U.S. government) intervention may prevent the downturn, the economy still remains in a fragile position. Spending units do not reduce their leveraging. The economy emerges with the same or higher level of debt, poised for another crisis when the government may again have to intervene. According to Minsky, financial crises may occur at increasingly close intervals as long as debt-to-income ratios remain high.

The knowledge that the Fed will perform a lender of last resort function or other bailout in a time of crisis may aggravate the propensity of bankers to engage in what becomes collectively risky lending. Bankers who do not participate (lend) liberally on the upswing will lose customers to their competitors. But the cumulative effect of all banks becoming more liberal in their lending is disastrous.

To summarize, it is in an extended recovery that the seeds of the downturn are planted. Spending units forget the lessons of the past as the past becomes more distant. They increase their outflows relative to their inflows. Debt-to-income ratios rise throughout the economy. The economy moves to a more vulnerable position, and some random event that would hardly be noticed in a different environment sets off a chain of bankruptcies and defaults that spread throughout the economy. Attempts by the Fed (or government) to prevent the downturn may aggravate the situation. When the downturn is prevented, the economy comes out of the financial crisis but remains in a highly leveraged and financially fragile position. A long-term cycle of boom and bust is an inherent part of a capitalist economy. How well do you think Minsky's theory explains the boom bust cycles the economy has been going through since the late 1990s? Can his theory explain the Great Financial Meltdown of 2008? It is the author's belief that it goes a long way in capturing the long-term endemic nature of financial crisis.

most successful pieces of legislation of the twentieth century. Much of the FDIC's success is often attributed simply to knowledge of its existence. That is, there have been no significant general runs on FDIC-insured banks because depositors know their funds are safe: a run would be a waste of time. For 50 years, the FDIC's losses were negligible, its reserves grew, and annually about two-thirds of all the insurance premiums paid in

were refunded to the banks. As a result of the FDIC's success, Congress raised the insurance limit several times from the original $2,500 in 1934 to $250,000 per account at the present. We should note that the limit was raised to $100,000 in 1980 and that for a comparable amount of "real" or inflation-adjusted deposit insurance in 2008, the limit would be more than $200,000. In 2006, the deposit insurance limit for retirement accounts was increased to $250,000. Despite the moral hazard problem, beginning in 2010 and every five years thereafter, limits for both regular and retirement accounts will be adjusted to account for inflation. Finally, in response to the financial crisis of September 2008, the deposit insurance limit was raised to $250,000 until the end of 2009.

By the early 2000s, many banks, brokerage houses, insurance companies, and other financial services firms had consolidated into megafirms, the likes of which have never been seen before. A failure of a megafirm such as Citigroup, which was created from the merger of Citicorp and Travelers, would have catastrophic effects on the economy. In mid-2007, Citigroup had about $2.2 trillion in assets! Failure of such a firm would quickly exhaust the resources of any safety net such as deposit insurance. (In September 2008, the FDIC has assets of around $45 billion and insures deposits worth over $4 trillion.) A moral hazard problem exists if market participants believe that the effects of such a failure would be so catastrophic that a taxpayer bailout would be inevitable. Given the correlation between risk and return, the incentive is to take on riskier ventures whenever moral hazard is increased. Note that a higher average expected return induces investors to accept more risk. But—investors beware—this does not imply that a higher return will be realized for any given investment.

Moral hazard also became a concern among those who are designing an international framework for financial stability. As financial flows across national borders increase, excessive risk taking may occur if financial participants think that international financial organizations such as the International Monetary Fund (IMF) will bail out a country in crisis by acting as a lender of last resort or encouraging policies that prevent currency devaluation. In any case, if investors' losses are reduced or eliminated, a moral hazard problem will form, encouraging excessive risk taking. The previously mentioned currency crises in Mexico, Asia, Russia, and Argentina resulted in massive international financial support in an attempt to bail out the troubled economies. Indeed, investors did lose, but they would have lost more without the bailouts organized by the IMF.

Having considered the reasons that recurring financial crises plague the economy and looked at some of the factors that increase the probability of a financial crisis, we now turn our attention to other areas of concern. Please see "A Closer Look," about the collapse of the savings and loan industry in the 1980s.

Recap Moral hazard results from the reduction in market discipline caused by the presence of deposit insurance. Moral hazard leads to excessive risk taking that can result in financial debacles. The existence of large megafirms could result in a moral hazard problem if market participants believe the firms' failure would cause enough havoc in the economy to prompt the government to step in and bail out the firms. The moral hazard problem may also exist in international markets if participants believe an international organization will bail out a country in crisis.

OTHER AREAS OF CONCERN

As the nation so painfully found out in late 2008, financial institutions and markets in the early 2000s faced the potential for new and greater stresses and strains. Some of these new situations resulted from the changing composition of balance sheets, some

The Savings and Loan Debacle

Throughout most of the 1980s, the savings and loan (S&L) industry in the United States experienced severe strain. More than 1,500 institutions failed; many others downsized, and the industry as a whole shrank considerably. Taxpayers spent billions of dollars to bail out the industry because the financial crisis threatened the health and stability of the entire economy. Today the industry is far different from what it was at the start of the 1980s. The public at large has been disillusioned, questioning the safety and soundness of S&Ls and the financial system as a whole. The honesty and integrity of S&L owners, regulators, and even some members of Congress have been called into question.

As in most crises, the seeds of the S&L debacle were planted long before the first sprouts of trouble appeared. In many ways, the roots of the crisis can be found in the way S&Ls do business. Unless interest rates remain fairly stable for long periods of time, as they did from the early 1950s until the 1970s, it is risky to fund long-term loans or purchase long-term assets with short-term deposits. If interest rates rise, the cost of the funds borrowed over the short-term can increase above the amount long-term assets are earning. As you saw in Chapter 4, S&Ls were established for the express purpose of borrowing short from passbook savers and lending long in order to finance mortgage loans. That is, they were designed to engage in behavior that would be dangerous in an environment of volatile or rising interest rates.

From the early 1950s on, the U.S. economy experienced a slow upward drift in interest rates. Regulation Q, which put a ceiling on the interest rate that could be paid on deposits, applied to S&Ls as well as commercial banks. In fact, the ceiling for S&Ls was maintained at 0.5 percent above the ceiling for commercial banks. The purpose of this differential was to encourage savers to deposit funds into S&Ls, which then could be used to make mortgage loans, thus encouraging home ownership. With Regulation Q in place, the cost of the funds borrowed mostly from passbook savers was maintained at or below the ceiling limits. Small savers, at least for a time, had few alternatives to passbook savings accounts in depository institutions. Consequently, disintermediation (the removal of funds from FIs) was relatively minor when interest rates on other financial assets such as Treasury bills or commercial paper went above the Regulation Q limits. The other financial assets were generally unavailable to small savers who did not have the minimum amounts required to purchase them. For example, $10,000 is the minimum amount needed to purchase a Treasury bill. By the 1970s, however, small savers did have money market mutual funds as an alternative to passbook accounts in depository institutions.[a] Still, the situation fermented for some time before the crisis occurred. By the late 1970s and early 1980s, events had begun to unfold that would result in a total collapse of the industry and, as you shall see, a large taxpayer bailout.

To understand the burgeoning crisis, recall that nominal interest rates are approximately equal to real rates plus the expected inflation rate. In the late 1970s, high nominal rates reflected expectations about inflation and not high real rates. That is,

the high nominal rates were the result of large inflation premiums. In fact, in the 1970s, real rates were often abnormally low and sometimes even negative despite the high nominal rates.

In late 1979, the Fed orchestrated a huge spike in already high nominal rates as part of a policy aimed at reducing inflation. Interest rates climbed far above the Regulation Q ceilings, which capped nominal rates while ignoring real rates. The spike in nominal rates caused severe disintermediation and/or the transfer of funds from S&Ls to money market mutual funds. Congress responded in 1982 by authorizing the S&Ls to offer money market deposit accounts that competed with money market mutual funds. Money market deposit accounts actually had an advantage over money market mutual funds because they were insured by the **Federal Savings and Loan Insurance Corporation (FSLIC).**[b] This legislative change slowed the disintermediation and the transfer of funds from the S&Ls to money market mutual funds, but it was probably too little too late. Also, it left the S&Ls with another problem. S&Ls had mostly long-term fixed-rate assets, primarily low-rate mortgages that were then funded by high-interest variable-rate accounts. Thus, the S&Ls were hit with a double whammy: their profits fell as their costs of funds increased faster than their earnings on assets, and the value of their assets also fell. Recall that when interest rates rise, the value of long-term bonds falls. Long-term fixed-rate mortgages are similar to long-term bonds in that when interest rates rise, the value of long-term fixed-rate mortgages goes down.

Federal Savings and Loan Insurance Corporation (FSLIC)
The insurance company that insured the deposits in S&Ls until 1989, when it was dissolved because of insolvency.

In 1981, economists estimated that the S&L industry had a substantial negative net worth that was far greater than the assets of the Federal Savings and Loan Insurance Corporation (FSLIC) that insured the deposits of the sickly S&Ls. Rather than confronting the problem head on in the early 1980s, which would have required injecting taxpayer funds into the system at that time, Congress responded with actions that would eventually make the situation much worse. Under the **Garn–St. Germain Act,** it expanded the lending powers of the S&Ls into product lines that paid a high return but were unfamiliar to S&L managers and entailed a lot of risk. Capital requirements—the cushion against losses—were also lowered so that the S&Ls could aggressively enter the new lending arenas. Rather than having to hold capital equivalent to 5 percent of assets, S&Ls were required to hold capital equal to only 3 percent of assets.

Garn-St. Germain Act
A law that expanded the lending powers of the S&Ls in the early 1980s.

With expanded lending powers and lower capital requirements, the industry went for broke and made new high-earning investments in such ventures as junk bonds and commercial real estate. Guess what happened? The S&Ls ended up losing a lot more and literally went broke. In late 1986, Congress granted the FSLIC $10.8 billion funded by borrowing against future deposit insurance premiums to be paid by the thrifts themselves. In 1988, the **Federal Home Loan Bank,** the equivalent of the Fed for S&Ls at the time, liquidated more than 200 insolvent thrifts by selling the institutions to individuals and firms. In the liquidation process, the buyers were compensated for the negative net worth of the institutions with an array of future guarantees and obligations, including tax breaks. None of these compensations required congressional authorization or appropriation and were later viewed with suspicion.

Federal Home Loan Bank
The regulatory body of the savings and loan industry until 1989.

Finally, in 1989, Congress responded with the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA), which attempted to resolve the problem of widespread failures within the industry and insufficient insurance funds to settle the

crisis. Over the course of the next decade, the total cost to the taxpayers was approximately $124 billion, which was much less than initial estimates. At the time of the bailout, the costs had already been incurred. The bailout shifted the costs from the owners and depositors of the failed thrifts to the public (taxpayers) at large. We should also point out that the bailout was to the benefit of taxpayers as well. We look at the specifics of the FIRREA and other recent regulatory measures in Chapter 17.

What can we conclude about the causes of the crisis? It is difficult to apportion blame, and doing so would not be productive anyway. Undoubtedly, the inherent problem of lending long and borrowing short when interest rates were rising was a major factor. Another factor was the extension of lending powers to the thrifts in the early 1980s. These new powers that allowed for more risk taking also seem to have attracted some dishonest individuals to the industry. Finally, regulators were slow to move in and shut down troubled thrifts, which caused eventual losses to be greater than they otherwise would have been. Congress was also slow to act. A lot of hard lessons were learned as taxpayer funds were diverted from potentially building better schools, roads, and infrastructure, among other more positive projects.

Endnotes

a. A person transferring funds from a depository institution to a money market mutual fund is not disintermediating but transferring funds from one type of intermediary to another.
b. The FSLIC was dissolved in 1989 as part of the S&L bailout. Since that time, S&Ls have been able to obtain deposit insurance from the FDIC.

resulted from activities that never showed up on financial statements, and others from the overall growth of the financial system relative to the economy.

National wealth consists of real assets such as houses, roads, infrastructure, and factories, plus net financial claims owed to Americans by foreigners. Domestic financial assets are not a part of national wealth because what is a financial asset to one party is a financial liability to another. Thus, domestic financial assets and liabilities cancel each other out.

In recent years, new financial products, new markets, and new institutions have proliferated. Financial flows and instruments had grown faster than national wealth and national income. In relative terms, the financial system is much larger than the real sector compared to their sizes a few decades ago. Derivatives allow new financial instruments to be created that base their claims on other financial assets, which base their claims on real assets. It is hoped that this potpourri of newly created instruments makes the financial system more efficient. However, the proliferation of financial instruments and the fungibility of financial claims in a global financial system augment the potential for new stresses and strains to the financial system. A crisis in one market quickly spreads to another through a contagion effect, and the unwinding of positions can take longer than in the past when the financial system was not so complex.

Off-Balance-Sheet Activities
Activities such as standby lines of credit, overdraft protection, unused credit card balances, and other commitments for which a bank is liable but that do not show up on the balance sheet.

Financial intermediaries now engage in new kinds of behavior, called *off-balance-sheet activities*, as they seek to obtain additional revenues and profits from areas outside traditional borrowing and lending. **Off-balance-sheet activities** include standby lines of credit, overdraft protection, unused credit card balances, and other commitments for

Standby Lines of Credit
Lines of credit (commitments) for which a bank is liable but that do not show up on the balance sheet.

which the FI is liable but that do not show up on the balance sheet. **Standby lines of credit** guarantee that the bank will lend funds to a borrower in the future as agreed upon today. One example of a standby line of credit is a letter given to an issuer of commercial paper that guarantees to pay off creditors on the due date if the issuer cannot. If a bank gives a standby line of credit for a fee to an issuer of commercial paper and the issuer defaults, the bank experiences a loss just as if it had made a bad loan. The only difference is that this exposure never shows up on the balance sheet, whereas the loan-loss exposure does. Unused loan commitments of banks and savings associations totaled about $6.2 trillion as of June 30, 2004. The increase since 1990 has been due almost exclusively to an increase in unused credit card balances, which tripled as a percentage of total assets. In the next chapter, we shall see that banks must now consider off-balance-sheet activities in calculating capital requirements.

As we saw in the last chapter, a derivative is a financial contract whose value is derived from the value of some other underlying asset, such as foreign exchange, bonds, equities, commodities, or an index. A derivative's value fluctuates with the value of the underlying asset. Examples of derivatives include financial futures, options, and combinations thereof. Derivatives are used by banks and others, including virtually every large corporation in the United States, to hedge, speculate, or arbitrage price differences. The use of derivatives allows for the unbundling of specific risks of financial assets into parts so that those more willing and able to do so bear the unbundled risks. Thus, the use of derivatives in this manner makes the financial system more efficient. As of June 30, 2008, five large banks represented 97 percent of the derivatives held by all banks. The value of the derivative contracts was about $182 trillion. Although this amount is extraordinarily high, many of these positions are offsetting positions used to reduce risk or to arbitrage to make a riskless profit. In these cases, there would be little or no risk. Thus, the net credit exposure to the banking system is only about $406 billion.

In recent years, derivatives have become even more complex. Powerful computers are often needed to assess the risks involved if one factor, say, an interest rate or exchange rate, changes by a small amount, perhaps only one-hundredth of 1 percent. Indeed, it is difficult, if not impossible, to understand all risks involved with extremely complex derivatives and all possible scenarios. For example, apparently many investors failed to understand the risks they were taking by investing derivative instruments based on subprime mortgage loans in 2008 and in the last chapter, we saw that credit derivatives played a significant part in the ongoing financial crisis. Nevertheless, derivatives will undoubtedly become even more complex in the future. Another problem is that even if they understand the risks, how can regulators be sure that institutions have proper oversight of their employees or operations to prevent the misuse of derivatives? Lax oversight could lead to large losses that catch management, regulators, and investors by surprise.

For these reasons, some analysts worry that derivatives may be too risky for banks. They believe that bank participation in these markets should be limited or that the market should somehow be regulated. Others go so far as to suggest that Congress ban the use of derivatives by banks altogether. This may be impossible because large banks could merely take this activity offshore, beyond the venue of the regulators. The concern is that some participants do not know enough about how derivatives work and the risks involved. If rates move by a small amount in an unanticipated direction, large losses can occur if derivatives are used for speculation. As was seen in Chapter 17, you cannot lose if derivatives are used only to hedge. When losses occurred, it was often because of insufficient oversight, both internally by management and externally by regulators.

Do market participants, including banks, have enough knowledge about them to be heavily involved? Can firms sufficiently oversee derivative activity? Will regulators

be able to properly control these markets? Risks from derivatives currently do not show up on balance sheets. Will regulators be able to ensure that such risks are disclosed? What role did these instruments play in the financial collapse of 2008? These are questions to be answered in the near future.

Recap The growth of the financial sector relative to the real sector, as well as the increased fungibility of financial claims, may exacerbate financial crises in the future. Off-balance-sheet activities such as standby lines of credit and unused credit card balances increase potential losses for financial institutions but do not show up on financial statements. Derivatives are financial contracts whose values are derived from the values of underlying assets, such as foreign exchange, bonds, equities, and commodities. Large banks and other financial and nonfinancial institutions are heavily involved in derivatives, and without proper oversight and regulation, large losses could occur.

In this chapter, we have come full circle from past stresses on the financial system and their resolution to the potential strains of the future. In the next chapter we look at how the risk that leads to financial instability is accessed and managed by financial institutions and investors.

Summary of Major Points

1. FIs have developed numerous ways to reduce risks and deal with them. FIs use diversification and expert credit analysis to manage credit risk. They use adjustable rate loans, forwards, futures, options, swaps, and securitizations to manage interest rate risk. Liquidity risk is managed by the ability to borrow funds, and exchange rate risk is managed with forwards, futures, options, and swaps. Despite these measures and because of the uncertainty of the future and the interdependence of financial claims, financial crises will occur from time to time.
2. A financial crisis is a severe upset in a financial market that is characterized by sharp declines in asset prices and the failure of many financial and nonfinancial firms. Financial crises can be brought on by sharp increases in interest rates, decreases in stock or housing prices, or deflation. The financial system was caught in an ongoing financial crisis in 2008 that began in the subprime mortgage market and spread to domestic and global financial markets. In September 2008, Congress passed the Emergency Stabilization Act of 2008, a $700 billion taxpayer bailout, in an attempt to mitigate this crisis.
3. Deflation can be worse than inflation because it increases the real value of debts that are denominated in dollars. A debt deflation occurs when prices and incomes fall, increasing the real value of debts and resulting in foreclosures and bankruptcies. The last time the U.S. economy experienced depression was in the Great Depression, although the Fed was concerned that the economy could slip into a deflation in the early 2000s.
4. *Moral hazard* refers to the reduction in market discipline that comes with the presence of a safety net to prevent losses. The presence of deposit insurance or the belief that regulators will take mitigating actions in the event of a financial crisis creates moral hazard. With moral hazard, banks and other intermediaries have an incentive to invest in riskier loans and investment. This gradual increase in riskier activities resulted in many bank failures in the 1980s. Megamergers in the financial services industry may also lead to a moral hazard problem if market participants believe that the resulting firms are "too big to fail." The moral hazard problem also exists in international financial markets if participants believe that an international organization such as the IMF will bail out a country in

crisis, thus reducing losses from what they otherwise would be.

5. The financial sector has grown faster than the real sector, exposing the system to potential crisis because of its enormous size and the fungibility of financial claims. Off-balance-sheet activities such as standby lines of credit expose a financial institution to risks but do not show up on balance sheets. Derivatives are financial contracts whose values are derived from the values of other underlying assets, such as foreign exchange, bonds, equities, and commodities. Some large banks are heavily involved in derivatives, and concern has been expressed as to whether enough is known about the risks involved with this exposure.

Key Terms

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Review Questions

1. Discuss ways in which each of the following risks can be reduced: default risk, interest rate risk, liquidity risk, and exchange rate risk.
2. Why does financial intermediation inherently involve risk? Are FIs better at evaluating risks than you are? Why or why not?
3. What is a financial crisis? Why does an economic downturn often lead to a financial crisis? Explain why the reverse is also true.
4. Can sharp increases in interest rates increase the risk of a financial crisis? Explain.
5. What is a debt deflation and why is it so onerous for the economy?
6. Is a financial crisis more likely to be triggered by inflation or deflation? Explain.
7. What does "too big to fail" mean? What are the costs of such a policy? Under what circumstances would your funds be safer in a large bank that made risky loans rather than in a small conservative local bank?
8. What is moral hazard? Why does deposit insurance inherently involve moral hazard? What factors contribute to moral hazard on the international level?
9. Discuss the factors that contributed to the S&L debacle during the 1980s.
10. Define *derivatives*. Why can they be risky?
11. S&Ls had limited experience making commercial loans, while commercial banks were extremely experienced in dealing with them. Explain how this difference could have exacerbated the adverse selection problem for the S&Ls in the 1980s.
12. Can derivatives cause massive losses if they are used only to hedge?
13. Discuss the reasons for the crisis in mortgage markets in the first decade of the 2000s.
14. What are some ways policy makers responded to the financial crisis of 2008–2009?
15. Define hedge, speculative, and Ponzi spending units. What is the financial instability hypothesis?

Analytical Questions

The questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

✓16. If all prices and my income fall by 25 percent, by what percent does the real value of my debt increase?

✓17. List three factors that can cause a financial crisis.

Suggested Readings

For an interesting article about the causes of the most recent financial crisis, see "How Government Stoked the Mania," by Russell Roberts, *The Wall Street Journal*, Friday, October 3, 2008, p. A21. Another article dealing with the same topic is "Pressured to Take More Risk, Fannie Reached Tipping Point," by Charles Duhigg, *The New York Times*, October 5, 2008, p. A1. **http://www.fdic.gov**, the FDIC's home page, has numerous articles about deposit insurance, including deposit insurance reform initiatives.

http://www.ffiec.gov, the home page of the Federal Financial Institutions Examination Council, has other relevant information about deposit insurance and risk.

The Wall Street Journal discusses the effect of the subprime mortgage market on asset-backed securities. The article is available online at **http://online.wsj.com/article/SB118696582444395589.html?mod=googlenews_wsj.**

For a look at some of the challenges in managing financial risk, see Riccardo Rebonato, *Plight of the Fortune Tellers: Why We Need to Manage Financial Risk Differently*, Princeton University Press, 2008.

An article that underscores many of the points in this chapter is "The Natural Instability of Financial Markets," by Jan Kregel, Working Paper No. 523, The Levy Economics Institute of Bard College (December 2007). It is available online through **http://www.levy.org.**

An interesting article on financial fragility is "In Time of Tumult, Obscure Economist Gains Currency: Mr. Minsky Long Argued Markets Were Crisis Prone; His 'Moment' Has Arrived," by Justin Lahart, *The Wall Street Journal* (August 18, 2007): A1.

An interesting book that examines financial corruption and the ability of most Americans to invest their way to financial security is Roger Lowenstein, *Origins of the Crash* (East Rutherford, NJ: Penguin Books, 2004). For a look at the causes, consequences, and cures for instability in financial markets, see Colin Mayer, ed., *Financial Instability* (New York: Oxford University Press, 2001).

For a look at "The Federal Reserve Responds to Crises: September 11th Was Not the First," see Christopher J. Neely, Federal Reserve Bank of St. Louis, Working Papers 2003–034 (October 2003). It is available on the Internet at **http://research.stlouisfed.org/publications/review/04/03/Neely.pdf.**

Economic problems in Japan are discussed in "Sorting Out Japan's Financial Crisis," by Anil K. Kashyap, Federal Reserve Bank of Chicago, *Economic Perspectives*, 26, no. 4 (Fourth Quarter 2002): 42–55.

For an article that looks at a model of domestic financial crises, see Martin H. Wolfson, "Neoliberalism and International Financial Instability," *Review of Radical Political Economics* 32, no. 3 (September 1, 2000).

The global consequences of Asia's economic woes are discussed in "How the Asian Crisis Affected the World Economy: A General Perspective," by Xinshen Diao, Wenli Li, and Erine Yeldal, *Economic Quarterly*, Federal Reserve Bank of Richmond, 86, no. 2 (Spring 2000): 35–59. For a different perspective, see Joseph E. Medley, "The East Asian Economic Crisis: Surging U.S. Imperialism?" *Review of Radical Political Economics* 32, no. 3 (September 1, 2000).

For a look at alternatives for a new financial architecture, see Kenneth Rogoff, "International Institutions for Reducing Global Financial Instability," *Journal of Economic Perspectives* 13, no. 4 (Fall 1999): 21–42.

"The Cost of the Savings and Loan Crisis: Truth and Consequences" is discussed in an article by the same name by Timothy Curry and Lynn Shibut, *FDIC Banking Review* 13, no. 2 (December 2000).

The lender of last resort function is examined from a global perspective in "The Free Market Is a Lie," *New Statesman* (October 9, 1998): 4.

In "Two Crises: Inflationary Inertia and Credibility," Sebastian Edwards looks at the role of government and the financial crisis in Mexico. The article can be found in *The Economic Journal* 108, no. 448 (May 1998): 680–702.

Three recommended books on the S&L crisis are J.R. Barth, *The Great Savings and Loan Debacle* (Washington, DC: American Enterprise Institute, 1990); *The S&L Debate: Public Policy Lessons for Bank and Thrift Regulation* (New York: Oxford University Press, 1991); and Robert Emmet Long, ed., *Banking Scandals, The S&Ls and BCCI* (New York: H.W. Wilson, 1993).

For interesting reading on financial instability, try Hyman Minsky, *Stabilizing the Unstable Economy* (New Haven, CT: Yale University Press, 1986).

Martin Wolfson, *Financial Crises: Understanding the Postwar U.S. Experience*, 2d ed. (Armonk, NY: M.E. Sharpe, 1994), gives a comprehensive history of financial crises through the mid-1980s.

Endnotes

1. The quote is from Alexander Chase.
2. There are some differences. The Ponzi scheme was pure fraud. Despite some illegal activities, the crisis in the subprime lending and dotcom markets were not necessarily brought on by purely criminal activities.
3. Although not caused by debt deflation, the FSLIC failed during the 1980s savings and loan crisis, and taxpayers injected funds to save depositors from losses.
4. Former Fed chair Greenspan develops this argument in his remarks "Risk and Uncertainty in Monetary Policy," presented at the Meetings of the American Economic Association, San Diego, California, January 3, 2004. The remarks are available online at **http://www.federalreserve.gov/boarddocs/speeches/2004/20040103/default.htm.**
5. See the Suggested Readings, where you can find sources that look in detail at some of these financial crises.
6. The moral hazard problem pertains to any depository institution that offers deposit insurance, including S&Ls. We focus here on commercial banks.
7. The inception of deposit insurance in the early 1930s resulted in federal examination of state banks that are not members of the Fed. This, in turn, caused a sharp decrease in some of the activities that contributed to the bank failures of the 1930s.

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CHAPTER TWENTY-TWO 22

It ain't what you don't know that will hurt you, it's what you think you know that ain't so.

—Will Rogers

Risk Assessment and Management

Learning Objectives

After reading this chapter, you should know:

How financial managers use the "Five Cs" of credit to assess default risk

A few strategies for managing default risk

How gap analysis is used to measure the threat of interest rate risk to bank earnings

Balance sheet strategies for managing interest rate risk

How to assess and manage liquidity risk

How the threat of interest rate risk to bank capital can be assessed using duration analysis (Appendix)

MANAGING BALANCE SHEET RISK AND RETURN

The goal of financial management is to enhance an institution's earnings and market value. The central problem is that strategies designed to achieve the highest rates of return are also characterized by the highest risk. Thus, management must pursue profitability in a manner that maintains the institution's solvency by avoiding excessive exposure to credit, interest rate, liquidity, and foreign exchange-rate risk. To pursue this dual mandate of high returns and acceptable levels of risk, most banks utilize an asset-liability committee. The committee is usually composed of senior management including the president, the chairperson, and those in charge of major functions, such as asset management (domestic/international lending and securities purchases), liability management (attracting and retaining various types of deposits), and economic analysis. The asset-liability committee is responsible for shaping a bank's basic borrowing and lending strategy. The committee meets several times each month to shape, coordinate, and direct a strategy that will sustain and enhance profitability without exposing the bank to excessive risk.

The basic issue for the asset-liability committee is the rate spread between the return on assets (interest rates received on loans and other assets) and the cost of liabilities (rates paid on deposits and other liabilities). After reviewing the bank's current balance sheet, regulatory requirements, the degree of competition from other lenders, the economic outlook, pending loan applications, and recent deposit growth, the committee will make decisions on loan pricing. Decisions such as where to set the prime rate and whether to offer loan applicants fixed- or variable-rate loans are made. In addition, the committee will decide how to raise the funds needed to support the planned expansion of assets. This is accomplished by altering the interest rates paid on various kinds of deposits and deciding how deposit products will be marketed to consumers. The resulting integrated strategy operates on both sides of the bank's balance sheet. Underlying all of the committee's decisions is a desire to limit the institution's exposure to levels of risk that compromise its long-term survival.

This chapter emphasizes how bankers assess their exposure to credit, interest rate, and liquidity risk. We emphasize how the "Five Cs" of credit management can be used to assess default risk and describe how income gap analysis can be used to assess the effects of interest rate changes on bank income. Our discussion of assessing and managing liquidity risk is less extensive. We save our approach to managing foreign exchange-rate risk for Chapter 23, where we explain how forwards, futures, and options can be used to hedge against foreign exchange as well as interest rate risk. Similarly, in Chapter 24 we examine the reasons for the increased use of asset-backed securities, interest rate swaps, and other derivative instruments, as well as how each can be used to reduce risk exposure. Although our discussion of risk assessment and management in this chapter focuses on commercial banks, the techniques and management strategies presented here can be used in many types of financial institutions.

When we talk about risk management, it is the bank's balance sheet—assets, liabilities, and capital—that is "managed." Consider the balance sheet of a typical depository institution. The asset side of the balance sheet records the business, consumer, and mortgage loans; government and municipal securities; corporate and foreign bonds; reserves; and other real assets owned by the bank. On the liability side of its balance sheet, our bank tracks the funds it owes to others in various kinds of deposits (small and large time deposits, savings deposits, and checkable deposits) commercial paper, corporate bonds, and borrowed funds such as Fed funds, repurchase agreements, and Eurodollar borrowing. These liabilities, and the interest rates paid to borrow them, determine a lender's cost of funds. The goal is to maintain a **positive spread**—wherein the rate of

Positive Spread
When the rate of return on assets is greater than the cost of funds on liabilities; this occurs when loan rates are above deposit rates.

return on assets rises above the cost of funds on liabilities—to ensure profitability. If the cost of funds rises above the rate of return on assets, the bank faces a **negative spread,** causing the bank's net income and equity to fall. If this persists, the value of the bank's liabilities will become greater than the value of its assets. The bank is then deemed **insolvent** and either sold or closed by financial regulators. Regardless of how the insolvency is resolved, the bank managers will lose their positions.

Negative Spread
When the rate of return on assets is less than the cost of funds on liabilities; this occurs when loan rates are below deposit rates.

Insolvent
Describes the condition in which a bank's liabilities are greater than the value of its assets.

The asset side of a bank's balance sheet generates its revenue stream. Earnings received on loans and leases, interest earned on securities holdings, and realized appreciation in the value of assets sold by the bank all contribute to a lender's earnings. However, these returns are not risk free. Generally, higher rates of return are associated with greater risk. In the absence of regulation and prudence, a bank manager could lend all of the bank's funds to a single borrower and earn high returns—assuming the borrower repaid the note. This high return strategy would also be accompanied by a high risk of default. Since the single loan dominates the bank's portfolio, this single default could also cause the bank's insolvency. Similarly, lower rates of return are associated with less risk. A bank manager could simply fill the asset side of its balance sheet with risk-free U.S. Treasury bills. However, he or she would also have to be content to accept low returns. The key is to balance the tradeoff between the pursuit of high earnings with the need to avoid an inappropriate level of credit, interest rate, and liquidity risk. The first step toward managing this tradeoff is to effectively assess each of these risks.

THE FIVE Cs OF CREDIT

Credit or default risk is the risk that a net borrowers will be unwilling or unable to repay a loan or satisfy the terms of a security it has issued. In such a case, the borrower is said to have defaulted on the loan or security (e.g., bond). Banks are exposed to credit or default risk whenever they make commercial or personal loans or buy the debt security of a corporation or governmental unit. In either case, the bank is serving as an intermediary channeling funds from new lenders to net borrowers in the economy.

Inherent in the loan process are the ever-present problems of asymmetric information, adverse selection, and moral hazard. Typically, potential borrowers know more about the risk and return of an investment project, and the likelihood of a loan being repaid, than does a bank loan officer. The balance of information between borrower and lender is not equal or symmetric. Instead, borrowers have the best knowledge about the project they are funding and will likely put the best possible spin on any credit report or project shortcoming. We refer to this problem as asymmetric information. Adverse selection also creates a need for active risk management. If those most likely to default pursue loans more determinedly than others, a bank will select borrowers whose actions will have the most adverse affect on its balance sheet. The bank will grant a disproportionate share of its loans to those least likely to repay. Higher loan rates exacerbate the adverse selection problem in two ways. First, the higher rates drive "responsible" borrowers out of the market, leaving only those willing to pursue high-return/high-risk investment projects. Second, the higher interest rates make the debt payments of those who do borrow more onerous, therefore increasing default risk. Once a loan is granted, a moral hazard problem emerges. Borrowers may be tempted to use loan proceeds in a manner that enhances the borrower's possibility of gain while endangering the lender with increased default risk.

Five Cs of Credit
The primary factors lenders must assess and manage to avoid excessive default risk exposure; these include a loan applicant's capacity, character, capital, collateral, and conditions.

To reduce default risk and its attendant problems, lenders have developed the **Five Cs of credit**—the most important factors credit managers must actively and prudently

assess, monitor, and manage to avoid defaults among their loan and security holdings. These factors include the following borrower or investment project characteristics:

1. Capacity: The borrower's ability to repay a loan
2. Character: The competency and willingness of a business firm's management or an individual borrower to repay his or her debts
3. Capital: The amount of equity or wealth a borrower has at stake in the proposed project
4. Collateral: The amount and liquidity of assets a borrower uses to secure a loan
5. Conditions: Forecasts of economic conditions, revenues, market share, degree of competition, and other variables—largely beyond a borrower's control—that may affect his or her ability to repay the loan

Capacity

The effective assessment of an individual loan applicant's capacity—his or her ability or potential for repaying a loan—requires careful evaluation of the applicant's income and wealth relative to other payment obligations. After gathering accurate financial information from an individual or business entity, the lender examines the applicant's expected future income stream that could be drawn upon to make debt payments. As we saw in Chapter 14, when evaluating a mortgage application, many lenders use various financial ratios to determine whether a loan applicant (or security issuer) can handle the additional debt load. A common rule of thumb, all too often ignored during the bubble years from 2002 to 2007, is that an applicant's **debt-to-income ratio**—total mortgage, automobile, credit card, student loan payments, and so forth as a share of gross income—should not exceed 36 percent. Similarly, his or her **housing-to-income ratio**—mortgage payment, insurance, property taxes, and private mortgage insurance relative to gross monthly income—should not exceed 28 percent. Both of these ratios are commonly computed on a monthly basis. Effective risk management begins with an accurate assessment of a borrower's capacity to repay a loan. This also applies to commercial loan applicants or security issuers. In either case, the borrower needs to show that his or her projected income will be sufficient to service all outstanding and proposed payment commitments.

Debt-to-Income Ratio
A financial ratio used to assess a loan applicant's capacity for repaying a loan, based on the share of one's total monthly debt payments relative to his or her gross monthly income.

Housing-to-Income Ratio
A financial ratio used to assess a mortgage loan applicant's capacity to repay a loan, based on the share of total housing expenses relative to one's gross monthly income.

Character

The techniques used to assess a potential borrower's character have changed significantly over the last two or three decades. In the past, local bankers gave important consideration to the personal reputation of the loan applicant. The difference between a loan being accepted or rejected might have been how well the banker knew the applicant through various civic organizations, family interactions, social activities or, most importantly, previous dealings at the bank. The role played by character in the credit process created a strong incentive on both the part of the customer and the banker to maintain long-term relationships. If a borrower was having short-term cash-flow problems and needed a small loan, he could apply for a "character loan" based simply on his reputation—as long as he had managed to repay loans regularly in the past. Similarly, bankers would often cover a bounced "insufficient fund" check to avoid offending a good banking customer and losing future deposits or loan business. This system worked as long as banking was a local business predicated primarily on business relationships. However, as banking became national and international in scope, most of the requisite relationships necessary for this type of character assessment have broken down. As a result, the techniques used to assess character have also needed to evolve.

Today most bankers are less familiar with their clients. Character assessment is done empirically by examining various facets of one's past. An applicant's credit and work history suggest how strongly a potential borrower is attached to the workforce and how diligently past debts have been repaid. These are the primary proxies used today to assess an applicant's ethical make-up. If a borrower has a checkered work history and/or has defaulted on past loans, he is presumed to be less likely to repay a debt than one who does not have these shortcomings. A similar assessment is extended to a business firm with a poor record of paying previous debts.

These measures are not perfect. Some borrowers may have had child-rearing or other responsibilities that prevented them from having a continual employment record. Similarly, the effects of a divorce and/or an uninsured and unanticipated medical expense could create a flawed credit history that may or may not accurately reflect an applicant's true willingness and ability to discharge future debts. Businesses also face competitive issues beyond their control that can adversely affect their ability to meet debt payments. If an applicant has an opportunity to meet with a banker face to face, these "flaws" can sometimes be explained and an adjustment can be made prior to the loan decision. In other circumstances, this interaction is impossible and the loan application is simply rejected.

Capital

Perhaps the best predictor of a default risk is the amount of equity or capital that a borrower has at stake in the project. On a balance sheet, capital equals assets minus liabilities. The same holds here. Capital is the difference between the market value of the property being purchased (the asset) and the amount borrowed (the liability). The greater the amount of capital a borrower has in a property, the lower the default risk to the lender. The reverse is also true. The less equity a borrower has in a project, the more likely he is to default.

Loan-to-Value Ratio
A financial ratio used to assess the degree of equity or capital a loan applicant has at stake in an investment project. It is computed by dividing the total loan amount financed by the total market value of the property.

One frequently used measure of capital, the **loan-to-value ratio,** assesses the degree of risk involved in mortgage, automobile, commercial equipment, and other types of lending. The loan-to-value ratio is computed by dividing the total loan amount by the total market value of the property. For example, if you wish to purchase a $200,000 house, a mortgage banker may be willing to finance only 90 percent of the home's market value. To qualify for financing, you would first need to put forward a 10 percent down payment. This $20,000 stands as your equity (your capital) or share of ownership in the project. (The value of the house itself—including your equity in it—will serve as collateral for the loan.) Lenders often require some minimum down payment for loans on homes, automobiles, and other real property. If the borrower is unable to come up with a down payment, the lender will either (1) deny the loan, (2) charge a higher interest rate to compensate for the higher risk, and/or (3) require the borrower to purchase insurance that guarantees payments if the borrower defaults.

The amount of equity a borrower has in a project is a good measure of default risk and a strong predictor of default. Studies cited by Avery, Bostic, Calem, and Canner found that "conventional mortgages with loan-to-value ratios of 91 percent to 95 percent at origination default more than *twice as frequently* as loans with loan-to-value ratios in the range of 81 percent to 90 percent and more than *five times as often* as loans with loan-to-value ratios in the rage of 71 percent to 80 percent" (emphasis added).[1] Making loans to those who have more equity in an investment gives the bank a larger cushion if real estate values fall. When the borrower in the previous example purchases a $200,000 home with a 10 percent down payment, the buyer has $20,000 worth of equity in the property. If the price of the home falls to $190,000, the borrower still has a

strong incentive to make payments to retain the remaining $10,000 in equity. However, if the home value falls to $170,000 and the borrower still owes $180,000, he would have negative equity of $10,000. The incentive to repay is much weaker. It may make sense for the borrower to default to avoid owing more than the property is worth. Even in circumstances in which borrowers experience negative equity, most have continued to make their payments to protect their credit ratings and/or in the hope that the property will again appreciate in the future, creating positive equity.

This observation that most loans were repaid even when there was negative equity helps explain why **"125s"** became so popular in the pre-2008 housing bubble years. With these special home equity loans, the bank loans the borrower up to 125 percent of a home's value. Lenders charge higher interest rates to compensate for the increased default risk caused by the negative equity and borrowers believed that property values would keep increasing thereby wiping out the negative equity. A combination of factors, such as negative equity combined with a "triggering event" that causes instability in one's income (divorce, loss of a job, or uninsured medical expenditures), cause borrowers to default. Before 2008, in the absence of these triggering events, most 125s were repaid. In theory, lenders who successfully screen potential borrowers and price appropriately for the default risk should receive a financial reward. This system seems to have malfunctioned, however, during the bubble years. A likely cause, examined in Chapter 14, was the lax underwriting standards which were encouraged by securitization of subprime loans.

125s
A specialized type of home equity loan popular during the real estate bubble, 2002–2007, in which the borrower is allowed to borrow up to 125 percent of a home's value.

Collateral

It is easy to confuse the notions of capital and collateral. The previous section explained that capital is the difference between the value of a borrower's property and the amount owed against it. Collateral is the value of the borrower's property given as security to the lender as a promise of loan repayment. Thus, collateral includes capital, but both are important elements of default risk assessment and management.

For auto or mortgage loans, banks require that the property being purchased serve as security (collateral) for the loan. In the case of a loan default, the bank has a right to repossess the auto or the real property. Let's say that a borrower has defaulted on an automobile loan that has an outstanding balance of $15,000. The bank can repossess the car, which it now owns, and resell it to generate funds for repaying the note. If the car sells for $10,000, the bank can still pursue the $5,000 unsecured debt obligation owed by the borrower. Although the bank repossesses the property, the borrower is not off the proverbial hook. The lender has a right to the property used as collateral. If its value is insufficient to pay off the loan—which was caused by the existence of negative equity—the lender continues to have a claim against the borrower. The same concept applies for commercial loans when a business firm is purchasing a new piece of equipment. Collateral works because it ensures—even in the presence of adverse selection and default—that the lender will not lose the entire loan amount. This is why mortgage bankers require that a title search be completed on a property before granting a loan. The banker wants to ensure that the property pledged as collateral is, in fact, owned by the person pledging it.

Banks use collateral when lending in the fed funds market or participating in various derivative markets. The value of collateral can change given changes in the economic conditions. To avoid this problem, especially with business loans, some lenders require a **compensating balance,** a special form of collateral that requires a portion of loan proceeds to be maintained on deposit at the bank. If a business firm is borrowing $100,000, the lender may require that $10,000 be held in a checking account at the bank as a form of security. In case of default, the lender can utilize these funds to partially compensate for its losses.

Compensating Balance
A form of collateral that specifies a portion of loan proceeds to be maintained on deposit at the bank making the loan.

Conditions

Prudent financial managers consider how a borrower's capacity, capital, and collateral may change when economic growth slows or credit conditions tighten. Thus, financial institutions employ economic forecasters to predict what will likely happen over the short- and long-term time horizons. They also employ credit analysts who use various scenarios to predict how a particular loan will perform given changes in the economy. If the bank's economists predict a recession, we can presume greater unemployment, decreased sales revenues for many firms, and perhaps even a fall in the value of assets used for collateral. Before making a highly leveraged commercial real estate loan—in which the buyer has little equity in the property—the bank should consider the possibility that the value of the real estate could fall. In this case, the value of the borrower's capital and the value of his collateral are reduced. If his job or other investment income is threatened by the slowdown in economic activity, his capacity for repaying the loan will also be reduced. The opposite occurs when forecasters predict continued economic growth, increased employment, increased sales revenues, and rising asset values.

Forecasts of economic conditions can also influence the aggressiveness with which a bank pursues various types of loans. An institution's forecast of continued strong economic growth, low unemployment, and stable prices might suggest that default risk is relatively low. Based on this insight, the bank may choose to hold a smaller portfolio of Treasury securities and instead hold a higher proportion of its assets as loans or even as higher-risk loans. In contrast, if the future is characterized by a business-cycle downturn and higher unemployment, it may make sense to tighten up lending standards (avoid higher-risk loans) and hold a larger proportion of total assets as lower-risk securities and cash rather than loans. Forecasted changes in interest rates also influence bank behavior.

Recap

The ultimate goal of bank management is to enhance an institution's earnings and market value. This requires that the bank create a positive spread between its rate of return on assets and the cost of its liabilities. If a negative spread persists, the institution will face insolvency. To avoid this misfortune, financial managers must carefully assess and manage default risk. The first step in this process is to identify the key elements involved in the credit decision—the Five Cs of credit: capacity, character, capital, collateral, and conditions. Before any loan is granted or security purchased, these five elements of default risk should be assessed carefully.

DEFAULT RISK ASSESSMENT AND MANAGEMENT TECHNIQUES

The Five Cs of credit require active assessment and management. To successfully counter the problems of asymmetric information, adverse selection, and moral hazard, managers must (1) engage in accurate discernment and pricing, (2) carry out careful observation, (3) encourage long-term banking relationships, and (4) manage asset portfolios actively.

Accurate Discernment and Pricing

Managers must discern which applications are characterized by a sufficient combination of capacity, character, capital, collateral, and favorable economic conditions such that a loan is approved and priced accordingly. Various laws prohibit banks from discriminating on the basis of sex, race, religion, and marital status. The techniques used to discern acceptable credit risks from unacceptable ones focus on economic factors. To assess these factors, the bank requires the potential borrower to submit a considerable amount

of information. This includes the commercial or individual applicant's balance sheet (assets and liabilities), income statement (revenues and expenditures), credit history (including a credit check with a credit reporting agency), work history, and, if applicable, an inspection of any property involved in the transaction. This information is then used to discern whether the Five Cs are sufficiently met. Weaknesses in one of the Five Cs may be compensated by strengths in another.

Over the last decade or two, default risk assessment has been profoundly altered by the growing importance of the three major credit reporting agencies (Experian, Equifax, and Trans Union) and technological innovation. **Credit reporting agencies** play an increasingly important role in overcoming the asymmetric information problem and in the decision to grant and price credit. They gather a wealth of public and private information and sell it to prospective creditors, insurers, and employers. Civic documents such as court records regarding lawsuits, judgments, bankruptcies, and tax liens are gathered by the agencies from publicly available databases. The agencies gather private information on the types and amounts of credit outstanding, bill-paying habits, and credit history from various lenders with whom the agencies maintain relationships, including credit card companies, department stores, banks, mortgage companies, and finance companies. The agencies compile this public and private information on individual borrowers into a **credit report** (sometimes referred to as a credit file). This report summarizes a person's debt profile and bill-paying habits and highlights any lingering legal issues. The advance of telecommunications technology, statistical analysis, and computers has allowed the data in credit reports to be quickly and efficiently merged with loan application data and other information to generate credit scores. "A Closer Look" explains how to go about obtaining your credit report.

Credit Reporting Agencies
Companies such as Experian, Equifax, and Trans Union that gather credit and legal information on individuals, compile it into a credit report, and then provide it to prospective creditors, insurers, and employers for a fee.

Credit Report
An account or file of an individual's legal and credit history. It includes information about previous legal judgments as well as information about the types and amounts of one's outstanding debts as well as a record of one's payment history.

A **credit score** is a three-digit number between 300 to 850 that predicts a loan applicant's likelihood of default based upon his or her credit history. (A score over 700 means you are viewed as a low credit risk; a score of 300–500 means you are a high credit risk.) Credit scores go by a variety of names. The most popular type, FICO scores, are prepared using software from the firm that created credit scoring in 1956—Fair, Isaac and Co. Other brand names include Beacon or Empirica. Many lenders use their own in-house versions tailored to their particular needs. Regardless of the name, credit scores are based on an individual's bill-paying history, current debt levels, types of debt outstanding, requests for new credit, and the length of time credit has been in use. Loan applications that used to take days or weeks to approve can now be discerned and priced in a matter of hours. More importantly, credit scores allow for far more subtle distinctions between various risk classifications, helping lenders price accordingly.

Credit Score
The three-digit number that predicts a loan applicant's likelihood of default based upon his or her credit history.

Instead of dividing applications into just "good" versus "bad" credit risks, bankers now engage in **risk-based pricing.** This involves grouping applicants into various risk tiers ranked by quality. The best "prime" borrowers are rated as A. The ranking continues down through various "subprime" categories of A–, B, C, and D tiers. Highly rated borrowers are charged the lowest rates. The interest rates charged increase as credit score declines. As of early 2009, only about 11 percent of the surveyed population ranks above 800, and 29 percent between 750 and 799. The use of this more sophisticated discernment mechanism has allowed lenders to reclassify some borrowers from prime to subprime and to charge rates according to the best estimate of default risk exposure. Improved discernment and pricing have resulted in higher earnings.

Risk-Based Pricing
Charging different interest rates to borrowers based on an assessment of a loan applicant's default risk; highly rated applicants are charged the lowest rates.

Lenders need to be careful about making higher-interest loans. We know from our experience with adverse selection that the riskiest borrowers are likely to pursue a

A Closer Look

Obtaining and Correcting a Credit Report

Credit reports play a critical role in influencing one's credit score, access to credit, and in some cases, access to employment and insurance. Given this significance, it seems prudent to ensure that the information in one's credit file is accurate. It is fairly easy to request a copy, analyze the report, close unused accounts (or those you thought were already closed), and report errors. If you find an error, you should file a dispute with your local credit bureau. It must investigate your claim and either verify the item in dispute or clear it from your record. Adverse and accurate entries stay on one's credit report for 7 years and a bankruptcy case stays on for 10 years. Thus, failure to pay your bills can have lasting consequences.

Individuals are entitled to one free credit report from each of the three major credit reporting agencies per year. This may be requested from the Federal Trade Commission's Web site: www.ftc.gov/freereports (as of 2009). Consumers must be careful, as many private companies purport to offer free credit reports, but actually charge for information that could sometimes be obtained for free. The FTC Web site states its site is the ONLY authorized online source for you to get a free credit report under federal law. The FTC further states: "You can get a free report from each of the three national credit reporting companies every 12 months." Some other sites claim to offer "free" credit reports, but may charge you for another product if you accept a "free" report.

If you have been denied credit, employment, or insurance as a result or your credit report and you request a copy within 30 days of receiving notice, you are entitled to a free copy of the relevant credit report, in addition to the one free per year. There are three main credit reporting agencies: Equifax, Experian, and Trans Union. To request a copy of your credit report, contact the agencies by phone or on the Internet:

Equifax	www.equifax.com
Experian	www.experian.com
Trans Union	www.transunion.com

Credit Rationing
Charging a lower interest rate than some borrowers are willing to pay and apportioning loans and loan amounts only to very safe borrowers, with favorable credit ratings and low probability of defaulting.

loan with the most persistence. Lenders that specialize in the subprime market—lenders making loans to those with A– or lower credit scores often have the highest loan rejection rates. These lenders may engage in **credit rationing**—purposely charging a lower interest rate than some borrowers are willing to pay and then apportioning loans only to those with sufficient credit worthiness. This lower rate reduces adverse selection and default risk in two ways. First, the riskiest borrowers are simply denied credit. Second, the lower rate makes it easier for those who are granted loans by lowering their debt payments. Credit rationing can also be used to reduce moral hazard. In some cases, a lender may ration credit by approving a loan but then lending less than the full amount

Credit Scoring and Fair Lending

Are minorities and women unfairly denied credit because of credit scoring techniques? Will legal action be taken against lenders as a result? Authors of articles published in the banking and business press suggest that the answer to both questions is "Yes." Critics of credit scoring say that blacks and other minority members are at a disadvantage with credit scoring techniques because the scores give little or no weight to the loan products used in minority neighborhoods. The loans extended in minority neighborhoods are often from community groups, subprime lenders, or finance companies. These lenders are less likely to report information to credit bureaus. In some cases, predatory lenders may withhold positive credit information to ensure that a borrower cannot refinance at a lower rate elsewhere. This lack of information in the file leaves minority borrowers at a disadvantage. Women, too, are likely to be at a disadvantage. Married women find that when they apply for credit, the joint accounts they hold with their spouse are often listed in only the husband's name. The result: female borrowers have less positive credit information on record and their lower credit scores reflect it.

Given the broader conceptions of discrimination used by the federal regulators, this apparent bias against minorities and women may be grounds for legal action. Federal financial regulators identify three types of illegal discrimination with respect to fair lending practices: overt discrimination (intentional denial or adverse loan terms because of bigotry), disparate treatment (treating equally qualified applicants differently), and disparate impact (using a policy or practice that disproportionately and adversely affects a protected group). It is this last category that may cause problems for bankers who use credit scoring techniques to assess loan applicants. One appeal of credit scoring is that it would eliminate overt discrimination as a criterion for denying a loan or determining loan terms. However, it may simultaneously increase disparate impact discrimination. *Forbes* quotes John P. Relman of the Washington Lawyers' Committee for Civil Rights and Urban Affairs, who makes just such a claim. "I'm positive credit scoring is going to have an adverse effect on African-Americans and Latinos. If it continues to be used, it will be challenged by either private-sector plaintiffs or the Justice Department." According to compliance expert Jo Ann Barefoot, the current environment calls for "proactive risk management." Bank managers must use statistically valid scoring systems, regularly revalidate them, and employ fair-lending "best practices" to avoid a lawsuit, or at least to avoid losing one.

Sources

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desired by the borrower. This leaves the borrower with fewer funds to spend in an inappropriate manner.

Careful Observation

The second step to effective risk management occurs after a loan has been originated. The borrower's financial actions must be observed to ensure moral hazard is avoided and that the borrower continues to meet the conditions of the Five Cs under which the loan was approved. In some cases, a borrower is encouraged or required to move his checking account, credit card, and/or savings account to the lender's bank. This arrangement allows the bank to monitor the borrower's spending and savings behavior. Unusual levels of spending or lower-than-usual bank balances may suggest moral hazard or changes in a borrower's capacity to discharge the loan. At a minimum, the lender must closely track the borrower's repayment history and respond with requests for payments or begin foreclosure through the bank's collections department.

Long-Term Banking Relationships

The third step, despite changes in how character is assessed, requires bank managers to develop professional relationships with clients. Long-term banking relationships make the discernment and observation processes easier for both the borrower and lender. They also serve as a basis for repeat and referral business for the bank and greater flexibility for net borrowers. Borrowers can benefit by establishing credit lines or **loan commitments**—promises by a bank to lend a given amount of funds at a particular rate for a specified period of time that can be drawn on when the borrower experiences cash-flow problems.

Loan Commitments
Promises made by banks to a firm to lend a given amount of funds at a particular rate for a specified period of time.

Active Management of Asset Portfolios

Even after all Five Cs are satisfied and the previous three steps are followed, credit or default risk problems can emerge if our fourth and final step is not followed. Loan portfolios must be managed prudently. Lenders need to strike a balance between specialization and diversification. For example, during the "go-go" years of the oil patch in the 1980s, some banks in Oklahoma and Texas found it profitable to become experts in analyzing loan applications from firms working in the oil fields. The banker's ability to understand the needs of the industry, develop ongoing relationships with borrowers, and develop techniques to appropriately discern borrowers' Five Cs and price loans according to risk proved profitable. Because of this expertise, many of these lenders ended up with large proportions of oil loans on their balance sheets. When oil prices collapsed and companies went bankrupt, these lenders struggled and many failed. Had these lenders made loans in other parts of the country or to businesses in other industries, or simply held larger shares of Treasury securities, smaller shares of their portfolios would have defaulted and many of them would still be in business. The recent trend toward nationwide mergers is motivated at least in part by the desire of banking firms to diversify their loan portfolios both nationally and internationally.

In some cases, it is in a banker's interest to reduce credit or default risk by sharing it with others or eliminating it entirely by selling the loan. Sometimes a bank makes a loan that is simply too big—legally or from a risk management perspective—for its own balance sheet. In these cases, banks create a **loan participation**—an agreement that allows an originating bank to give partial interest in the loan to one or more banks. This practice is common among large money center banks to reduce default risk and to avoid the legal maximums allowed for loans made to a single borrower. As we

Loan Participation
A loan agreement that allows an originating bank to give partial interest in a loan to one or more additional banks.

Securitization
The pooling and repackaging of similar loans into marketable securities.

discussed with respect to mortgages in Chapter 14, many banks reduce their default risk exposure entirely by selling loans to another bank or to a firm specializing in **securitization**—the pooling and repackaging of similar loans into marketable securities. Because of the decreased default risk, as well as reduced liquidity and interest rate risk, securitization has spread from mortgage loans to automobile, small business, and student loans.

A final word of caution. We have framed our discussion of default risk management as the prudent management of an institution's balance sheet. Over the last few decades, off-balance-sheet activities—such as unused lines of credit, overdraft protection, unused credit card balances, and various commitments for which a bank is liable but do not appear on the balance sheet—have been growing in importance. The use of these instruments by the bank's clients, followed by a subsequent default, could harm the earnings and perhaps the solvency of a banking institution as certainly as a loan or security default. Effective default risk management also requires consideration of off-balance-sheet activities.

Recap

There are four main steps to effective credit or default risk assessment and management. First, managers must engage in accurate discernment and pricing. This includes using various credit scoring techniques, employing risk-based pricing, and engaging in credit rationing. Second, once a loan has been made, the borrower's actions should be observed to prevent moral hazard and to determine whether the borrower has experienced a reduction in his or her capacity and/or collateral that will adversely affect the likelihood of repayment. Third, long-term banking relationships reduce the costs of discernment and observation, encourage repeat business, and allow borrowers greater flexibility in meeting their credit needs. Fourth, financial managers need to manage their portfolios. This includes balancing the costs and benefits of specialization and diversification, sharing the risk with other lenders, and prudently using securitization. Off-balance-sheet activities should not be ignored.

ASSESSING INTEREST RATE RISK

As noted earlier, the operating goal of a bank manager is to maintain a positive rate spread between the return on assets and the cost of liabilities in an attempt to maximize the institution's market value. Our discussion of default risk emphasized how bankers try to avoid making loans or buying securities that result in default. The problem we now need to confront is that bank balance sheets tend to be asymmetric with respect to the time it takes to re-price or to adjust for changes in short-term interest rates.

Chapter 16 discussed the savings and loan industry's problems with interest rate risk. S&Ls held almost 80 percent of their assets in 30-year, fixed-rate mortgages and funded these with short-term, flexible-rate savings, checking, and time deposits. When interest rates rose in the late 1970s and early 1980s, the costs of funds rose much faster than the interest rates charged on loans. Many institutions failed and the federal government used taxpayer funds to bail out the industry in the late 1980s.[2] The problem illustrated by the structural mismatch between the interest rate sensitivity of S&L assets and liabilities remains relevant for our discussion of interest rate risk. Changes in interest rates—particularly increases in interest rates—create the possibility of a positive spread narrowing or turning into a negative spread. Higher interest rates also decrease the market value of loans previously originated and securities previously purchased.

These changes can cost a lender earnings and equity, and like the 1980s S&L debacle, may lead to an institution's demise. Given the increased volatility of interest rates over the last 30 years, managing interest rate risk has become a fundamental managerial task. The chapter appendix discusses ways to readjust balance sheets to manage risk. Chapters 23 and 24 will discuss how various types of financial derivatives can also be used to manage interest rate and other types of risk without restructuring bank balance sheets.

Income Gap Analysis

Despite its potentially serious consequences, interest rate risk is both measurable and manageable. The first step in any risk management strategy is to identify which assets and liabilities are interest rate sensitive over a particular time period. Take a moment to do that with the simplified balance sheet from First South-Western Bank in Exhibit 22–1. Which assets and liabilities will experience a change in their returns or costs over the next 12 months if interest rates increase?

On the asset side, interest-rate-sensitive assets (ISAs) will include those with maturities of less than one year and those with variable interest rates. In this example, we would include those securities ($80 million) and commercial loans ($20 million) with maturities of less than one year, as well as all variable-rate mortgages ($50 million). Adding these asset values together yields a sum of ISAs equal to $150 million. These represent the bank's assets, whose earnings will increase (decrease) if interest rates rise (fall). On the liability side, we again identify those instruments that will mature in less than one year or are otherwise characterized by variable interest rates. We will refer to these interest-rate-sensitive liabilities as ISLs. These include money market deposit accounts ($50 million), variable-rate CDs ($50 million), short-term (less than one year) CDs ($70 million), fed funds ($20 million), and other short-term (less than one year)

22-1
Balance Sheet for First South-Western Bank

Assets		**Liabilities**	
Reserves and cash	$100 million	Checkable deposits (fixed rate)	$50 million
Securities		Money market deposit accounts	$50 million
Less than 1 year	$80 million	Savings deposits (fixed rate)	$50 million
Greater than 1 year	$20 million	CDs	
Commercial loans		Variable rate	$50 million
Less than 1 year	$20 million	Less than 1 year	$70 million
Greater than 1 year	$80 million	Greater than 1 year	$30 million
Residential mortgages		Fed funds	$20 million
Variable rate	$50 million	Other borrowing	
Fixed rate	$50 million	Less than 1 year	$60 million
		Greater than 1 year	$70 million
All other assets	*$100 million*	*Bank capital*	*$50 million*
Total assets	$500 million	Total liabilities and capital	$500 million

Note: This evaluation of the bank's exposure to interest rate risk involves subtracting the institution's interest-rate-sensitive liabilities (ISLs) from its interest-rate-sensitive assets (ISAs). The resulting "gap" describes the degree to which the bank income will be affected by changes in interest rates.

22-2
The Effects of (Income) Gap and Interest Rate Changes on Bank Income

	POSITIVE GAP	NEGATIVE GAP	ZERO GAP
	Interest-rate-sensitive assets are greater than interest-rate- sensitive liabilities (ISAs>ISLs)	Interest-rate-sensitive assets are less than interest-rate- sensitive liabilities (ISAs<ISLs)	Interest-rate- sensitive assets are equal to interest-rate- sensitive liabilities (ISAs = ISLs)
Interest rates increase	Bank income rises	Bank income falls	Bank income is unchanged
Interest rates decrease	Bank income falls	Bank income rises	Bank income is unchanged

Income Gap
The difference between a bank's interest-rate-sensitive assets (ISAs) and its interest-rate-sensitive liabilities (ISLs).

borrowings ($60 million), for a total of $250 million. The costs of these ISLs will increase (decrease) if interest rates rise (fall). To compute the **income gap,** (which we will henceforth refer to as simply "gap")—we use Equation (22–1). It directs us to subtract our interest-rate-sensitive liabilities from our interest-rate-sensitive assets to compute the gap

(22-1) $$GAP = ISAs - ISLs$$

where

ISAs = interest-rate-sensitive assets
ISLs = interest-rate-sensitive liabilities

First South-Western has ISAs of $150 million and ISLs of $250 million. So,

$$GAP = \$150 \text{ million} - \$250 \text{ million}$$
$$GAP = -\$100 \text{ million}$$

South-Western's ISLs are greater than its ISAs, creating a negative income gap. Most banks find themselves in a similar situation. This means that the cost of attracting the bank's liabilities (the interest rate on various kinds of deposits) will go up more rapidly than the interest rate earnings received on its assets (loans and securities). It follows logically that if interest rates increase, bank income will fall. However, if interest rates fall, just the opposite would occur. With a negative income gap and falling interest rates, our cost of funds will fall more quickly than the rates we receive on our assets. Bank income will rise because of the widening positive spread.

We should also consider the case of a bank characterized by a positive income gap. This would happen whenever ISAs are greater than ISLs. In this second case, an increase in interest rates would cause the rates on assets to rise faster than the rates on liabilities. This, too, would cause a bank's income to rise. However, if we have a positive gap and falling interest rates, bank income would fall because of a narrowing spread. This is caused by the rates of return on loans and securities falling more quickly than the rates we pay to our depositors.

In the third possible case, when ISAs equal ISLs, the gap is zero. An increase or a decrease in interest rates causes the interest rates on liabilities and assets to move in tandem. Bank income remains unchanged by interest rate movements. These relationships are summarized in Exhibit 22–2.

Income Gap Analysis
An evaluation of the bank's exposure to interest rate risk that involves subtracting the institution's interest-rate sensitive liabilities (ISLs) from its interest-rate sensitive assets (ISAs). The resulting "gap" describes the degree to which the bank income will be affected by changes in interest rates.

Income gap analysis is widely used because it is simple, powerful, practical, and flexible. Our example covering a one-year time period could easily be applied and adapted to other time periods. This type of assessment is called *maturity-bucket gap analysis*. Bank managers may be interested in examining the bank's gap over the next week, month, quarter, year, or even over multiple periods. The key to tailoring this analysis is to identify which assets and liabilities are sensitive to interest rate movements in the time periods—the relevant maturity buckets—one wishes to analyze. To perform a gap analysis of First South-Western's balance sheet for next three months, we start by identifying ISLs and ISAs whose earnings or costs could change in the next three months (that level of detail is not shown in Exhibit 22–1). Similarly, if our asset-liability committee wants a gap report for the next year broken down by quarters, it identifies which ISLs and ISAs are sensitive to interest rate changes in each of the four quarters and then applies the analysis. As long as the bank maintains careful records regarding the maturity of its assets and liabilities, the bank's analysts will have little trouble applying Equation 22–1 to whatever time period or periods the asset-liability committee wishes to examine.

To further guide our asset-liability committee's strategic management, gap analysis can be used to predict not only the effect of interest rate movements on the direction of bank income over various time periods—increase, decrease, or no change—it can also be used to estimate the magnitude of the change. What effect will a 3 percent increase in the interest rate have on First South-Western Bank's income? By using Equation (22–2), the solution is calculated easily. We take the gap and multiply it by the change in the interest rate to solve for the change in bank income. Caution: make sure you use the correct signs (positive or negative) for both the gap and the change in the interest rate.

$$\Delta BI = gap \times \Delta_i \qquad (22\text{–}2)$$

where

ΔBI = change in bank income
Gap = ISAs – ISLs from Equation (22–1)
Δ_i = change in interest rates

First South-Western had a gap of –$100 million. Assuming a 3 percent increase (+0.03) in the interest rate we find:

$$\Delta BI = -\$100 \text{ million} \times .03$$
$$\Delta BI = -\$3 \text{ million}$$

In this case, the bank can expect its income to fall by $3 million because of its negative gap combined with the 3 percent rise in interest rates. If interest rates fell by 3 percent instead, the symbol in front of 0.03 would be a minus sign and our $3 million loss would become a $3 million gain.[3]

Managing Interest Rate Risk in Response to Income Gap Analysis

Understanding the connections among gap, interest rate changes, and changes in bank income is essential for the effective management of interest rate risk. In short, the larger the absolute value of the gap, the greater the banks' exposure to interest rate risk. Forecasts

of future interest rates and the degree of risk the bank's asset-liability committee is willing to embrace determine how much risk it is willing to assume. If the bank expects interest rates to rise over the upcoming year, it should move its balance sheet toward a positive gap. The asset-liability committee should direct those in charge of liability management to seek fewer interest-rate-sensitive liabilities. This could be done by locking in depositors with more fixed-rate, longer-term CDs. Engaging in fixed-rate, longer-term borrowing through the issuance of bonds might also be recommended. Similarly, managers would be discouraged from increasing the bank's holdings of short-term, variable-rate sources of funds like variable-rate CDs, fed funds borrowing, Eurodollar borrowing, and money market deposit accounts. The committee should also direct asset managers to pursue assets that are more interest rate sensitive. This would lead to the origination of more variable-rate mortgages, more short-term commercial loans, as well as an increase in short-term security holdings.[4] Longer-term mortgages and securities could be sold to facilitate this move toward a positive gap.

If the committee expects interest rates to fall, the bank's balance sheet should be moved toward a negative gap by doing the opposite of the previous process. Here, our committee would advocate holding more interest rate-sensitive liabilities and fewer interest rate-sensitive assets. The liability side would move toward the use of shorter-term and variable deposits, fed funds, and other borrowings. The asset side of the balance sheet would be biased toward fixed-rate, longer-term mortgages, loans, and securities. The absolute size of the gap in either case will depend on the committee's degree of risk aversion. This process makes the management of interest rate risk fairly straightforward. A bit of the real-world complexity can be appreciated by remembering that a bank's depositors and borrowers also rely on interest rate forecasts. If interest rates rise, borrowers want fixed-rate mortgages and loans when banks are trying to move their balance sheets toward variable-rate and shorter-term loans. Thus, this adjustment process is easier to describe theoretically than it is to implement in practice. Fortunately, a number of new financial instruments have been created to hedge interest rate risk that do not require the restructuring of the balance sheet. You will learn more about these in the next two chapters.

Recap Interest rate risk is the danger that changes in interest rates will adversely impact a lender's income or capital. Income gap (or simply "gap") analysis is a frequently used, powerful, and flexible technique for evaluating the impact of interest rate changes on bank income. This analysis takes an institution's interest-rate-sensitive assets (ISAs) minus its interest-rate-sensitive liabilities (ISLs). The resulting "gap" describes the degree to which the bank income will be affected by changes in interest rates. The higher the absolute value of the gap, the greater the degree of interest rate risk. Most banks have a negative gap. Thus, increased interest rates cause bank income to fall. One can predict the magnitude of change in bank income due to interest rate changes by multiplying the gap by the percentage point change in the interest rate. If a bank's asset-liability committee believes interest rates will rise in the future, it should move the bank's balance sheet toward a positive gap. Similarly, if the committee expects interest rates to fall, it should move the bank's balance sheet toward a negative gap.

ASSESSING LIQUIDITY RISK

Liquidity risk is the third and final risk discussed in this chapter. Liquidity risk is the danger that a financial institution will be required to make a payment when the intermediary

has only long-term assets that cannot be converted to liquid funds quickly without a capital loss. As with credit and interest rate risk, assessment and management of liquidity risk is primarily about the balance sheet.

Liquidity Ratio
A commonly used measure of liquidity and interest rate risk. It is computed by taking the difference between a bank's short-term investments and liabilities and dividing them by the bank's assets.

The **liquidity ratio** is a tool frequently used by depository institutions to assess liquidity risk. It measures the difference between a bank's short-term investments and its short-term liabilities, all divided by the bank's assets. This is similar to the income gap measure shown in Equation 22–1 (Gap = ISAs – ISLs) divided by a bank's total assets.[5] We will allow our interest-rate-sensitive assets and liabilities to serve as proxies here for short-term assets and liabilities. This measure is summarized in Equation (22–3).

$$\text{Liquidity ratio} = \frac{\text{ISAs} - \text{ISLs}}{\text{total assets}} \tag{22–3}$$

where

ISAs = interest-rate-sensitive assets
ISLs = interest-rate-sensitive liabilities

We can compute a liquidity ratio using the data from the First South-Western Bank balance sheet shown in Exhibit 22–1. We can take our gap measure (the numerator) of –$100 million and divide it by the total assets of $500 million.

$$\text{Liquidity ratio} = \frac{-\$100\,\text{million}}{\$500\,\text{million}} \tag{22–4}$$

$$\text{Liquidity ratio} = -.20 \text{ or } -20\%$$

Liquidity ratios are typically less than plus or minus 10 percent. Thus, First South-Western Bank appears to face a serious liquidity problem and is exposed to substantial interest rate risk.

MANAGING LIQUIDITY RISK

The causes of illiquidity come from both sides of the balance sheet. On the asset side, we may run short of funds because we make more commercial or mortgage loans than expected, receive fewer loan and interest payments than expected, and/or because we hold securities that are less marketable than anticipated at their purchase. On the liability side, liquidity problems can emerge when bank customers withdraw more checkable, savings, and/or money market deposits than expected. Fortunately, federal deposit insurance and the Fed's lender-of-last-resort actions have curbed the bank runs of earlier times, averting the substantial liquidity problems that accompanied them. Regardless of which side of the balance sheet causes the problem, the result is the same—a shortage of cash and/or reserves.

One additional cause of illiquidity involves off-balance-sheet use of unused credit lines and letters of credit. Banks offer credit cards and home equity lines of credit to consumers and letters and lines of credit to commercial customers. These individuals and businesses use the lines and letters to manage their own liquidity needs. Despite their absence from bank balance sheets, these untapped credit sources can be a real source of liquidity risk. Imagine a business cycle downturn that causes increased unemployment and decreased sales revenue. To meet other debt payment obligations, individual and business customers may draw on their unused lines of credit. This sudden and

possibly large demand for cash may leave banks scrambling for liquidity. Traditional measures of liquidity risk, such as the liquidity ratio, do not account for this very real danger. Prudent managers monitor the balance sheet and off-balance-sheet activities for risk exposure.

Like most causes of illiquidity, the solutions can come from either side of the balance sheet. If the problem is expected to be a temporary one, bankers generally turn to the liability side of the balance sheet for a solution. This might involve raising the advertised rates on CDs, savings accounts, or money market accounts to attract depositor funds. If this is insufficient, the bank may turn to other forms of borrowing, such as repurchase agreements, the fed funds market, the Eurodollar market, and/or the Fed's discount window. If the liquidity problem is perceived to be a longer-term problem, the bank's managers reluctantly turn to the asset side of the balance sheet. On the asset side, funds are raised by selling securities, commercial loans, mortgage loans, and other assets. Sales of near-reserves like Treasury bills are often tapped for liquidity needs. The increased ability to securitize mortgage, automobile, educational, and even credit card loans has greatly increased the liquidity of these types of loans. Not only do these sales reduce liquidity risk, they also reduce default risk. Nevertheless, managers are reluctant to engage in asset sales because such sales decrease the institution's size and are likely to reduce future earnings.

The assessment and management of credit, interest rate, and liquidity risk are essential to enhancing a bank's earnings and its market value. The increased volatility of interest rates and financial asset prices over the past 30 years, the increasingly competitive markets for lending, the growing international connections among markets, and the relentless development of computing, communications, and statistical analysis have made effective risk management more technically sophisticated, rapid, and important to a financial institution's bottom line. The core of the management strategies posited in this chapter involves the restructuring of the bank balance sheet to manage risk. The next two chapters explain a number of new instruments that allow the management of risks without restructuring the balance sheet.

Recap Liquidity risk is the danger that a financial institution will be required to make a payment when the intermediary has only long-term assets that cannot be converted to liquid funds quickly without a capital loss. The liquidity ratio is frequently used to measure liquidity risk exposure. It involves taking the difference between a bank's short-term assets and liabilities and dividing this by its total assets. Illiquidity can be managed on both sides of the balance sheet. On the liability side, the bank can take on additional liabilities by attracting various kinds of deposits or by tapping other sources of borrowing. On the asset side, banks can sell loans or securities to raise cash. Generally, banks prefer to avoid asset sales because they make the institution smaller and may lower future earnings. Recent changes in the financial system have increased the sophistication, speed, and importance of effective risk management.

ADDITIONAL RISKS

The year 2008 brought many surprises—the demise of the traditional investment banking model outlined in Chapter 21, bank failures, an old-fashioned liquidity crunch, and a new twist on an old idea: fraud on a grand scale (see "A Closer Look: Bernard Madoff and His Modern Ponzi Scheme"). The events of 2008 lead one to ponder an old idea, is there distinction between predictable risk and unpredictable uncertainty? Could the

A Closer Look

Bernard Madoff and His Modern Ponzi Scheme

On December 11, 2008, Bernard Madoff was arrested for what appears to be the largest investor fraud ever committed by one person. The day before, Mr. Madoff told those working for him that the management and advisory segment of his business was basically "a giant Ponzi scheme."

Chapter 21 introduced the notion of a Ponzi scheme, where investors entrust their funds to an "expert" who appears to be able to earn an unusually high rate of return. In truth, their funds are not placed into the real investments. Those who wish to withdraw funds are paid out of the inflow from new investors. In the end, the "expert" ends up owing much more than exists in actual assets (at which point he might try to disappear or move to a different country).

Several elements distinguish the fraud of Bernard Madoff: First, the size. It appears that $50 billion may have been lost by investors. Second, the reputation of the perpetrator. While it is typical for one who starts a Ponzi scheme to wear nice clothes and appear respectable to his unsophisticated and naive victims, Mr. Madoff's stellar reputation appeared to be supported by a lifetime of philanthropy and verifiable success. Third, the return promised. The returns Mr. Madoff offered didn't seem unrealistically high, but they were unusually stable. Fourth, the length of the scheme. It appears Mr. Madoff may have been lying about investment returns for decades. Finally, the apparent sophistication of the victims. Madoff investors included hedge funds and financial professionals with rich and savvy customers.

Mr. Madoff was an active member of the National Association of Securities Dealers (NASD), a self-regulatory organization. His firm was an important force behind development of the NASDAQ (National Association of Securities Dealers Automated Quotations, a stock exchange). The fact that he had previously served as the NASDAQ chairman, and was on its board of governors, further enhanced his reputation.

One troubling aspect of this scheme is that many investors did not even know their funds were with Madoff. A number of professional "feeder funds" received investors' funds, placed them with Madoff, and charged a fee for doing so without informing clients. Individual investors would receive statements indicating a diversified portfolio, not indicating they were all through Bernard L. Madoff Investment Securities LLC.

An important lesson from this sorry episode is that financial regulation of the U.S. securities industry has been inadequate. Hopefully new regulations and oversight will prevent such disasters in the future.

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A Closer Look

Black Swans

Investopedia (http://Investopedia.com) defines a black swan as: "An event or occurrence that deviates beyond what is normally expected of a situation and that would be extremely difficult to predict." This term has become popular in speaking about the financial crisis that began in 2007. A fundamental question is, how much of what happened was predictable?

This usage of the term "black swan" was popularized by Nassim Nicholas Taleb, a finance professor and former Wall Street trader, in his 2007 book *The Black Swan: The Impact of the Highly Improbable.* Some of Taleb's examples of unpredictable black swan events include the rise of the Internet, the personal computer, World War I, as well as the September 11, 2001, attacks. In the *Black Swan,* Taleb writes:

> Globalization creates interlocking fragility, while reducing volatility and giving the appearance of stability. In other words it creates devastating Black Swans. We have never lived before under the threat of a global collapse. Financial institutions have been merging into a smaller number of very large banks. Almost all banks are interrelated. So the financial ecology is swelling into gigantic, incestuous, bureaucratic banks—when one fails, they all fail. The increased concentration among banks seems to have the effect of making financial crisis less likely, but when they happen they are more global in scale and hit us very hard.

Some ask if the financial crisis of 2007/08 was an unpredictable black swan event. Evidently not to Nassim Taleb, who reportedly earned vast sums during 2008 for correctly anticipating the financial turmoil.

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Nassim Nicholas Taleb, *The Black Swan: The Impact of the Highly Improbable* (New York: Penguin Books Ltd., 2007).

Nassim Nicholas Taleb's homepage (accessed 1/3/09) at www.fooledbyrandomness.com.

financial crisis of 2008 have been predicted? In hindsight it certainly should have been. In fact some people, such as Nassim Nicholas Taleb and Nouriel Roubini (aka "Dr. Doom"), did warn that financial crisis was likely when home prices stopped increasing. But as the old saying goes, "the more things change the more they stay the same." After the current financial and economic crisis is over, it seems probable that risks of the future will be similar to the risks of the past, and that the traditional approaches to risk assessment and management will be as useful as ever.

Summary of Major Points

1. To generate earnings and to increase market value, banks must maintain a positive spread between the rate of return on their assets and the interest rate cost of their liabilities. This endeavor requires careful assessment and management of credit, interest rate, and liquidity risk.
2. Before any loan is granted or security purchased, credit analysts must assess a borrower's Five Cs of credit: capacity, character, capital, collateral, and conditions. Capacity refers to a borrower's ability to repay a loan. Character refers to a borrower's competency and willingness to repay. Capital is the amount of equity a borrower owns over and above the amount financed. Collateral describes the assets used to secure a loan. Conditions involve changes in economic conditions that might make it more difficult for a borrower to pay back a loan.
3. Effective credit or default risk management requires four steps. Managers must (1) engage in accurate discernment and pricing, (2) observe borrower behavior, (3) establish long-term banking relationships, and (4) actively manage their portfolios. In addition, off-balance-sheet exposure to credit risk should not be ignored.
4. Interest rate risk is the danger that changes in interest rates will adversely impact a lender's income or capital. Threats to a bank's income can be assessed using gap analysis. Gap (or income gap) analysis involves subtracting an institution's interest-rate-sensitive liabilities (ISLs) from its interest-rate-sensitive assets (ISAs). The higher the absolute value of the gap, the greater the degree of interest rate risk. Generally, increases in interest rates cause decreases in bank income because of negative income gaps. The magnitude of these changes in bank income can be computed by multiplying the gap by the percentage-point change in the interest rate.
5. If bank managers believe interest rates will rise, they should steer the bank's balance sheet toward a positive gap to increase future bank income. Similarly, if bank managers believe interest rates will fall, they should steer the bank's balance sheet toward a negative gap.
6. Liquidity risk is the danger that a financial institution will be required to make a payment when the intermediary has only long-term assets that cannot be converted to liquid funds quickly without a capital loss. This risk can be measured using the liquidity ratio.
7. Liquidity risk can be managed on the liability side of the balance sheet by attracting various kinds of deposits or by tapping other sources of borrowing. On the asset side, liquidity problems can be addressed by selling loans or securities to raise cash.
8. (Appendix) The effect of interest rate movements on capital can be measured using duration, and/or duration gap analysis. These include price risk—the hazard that increases in interest rates will lower the present value of asset holdings—and reinvestment risk—the chance that decreasing interest rates will lower the returns on current and future investment holdings.
9. (Appendix) Duration analysis measures the responsiveness of a bank's assets, liabilities, and net worth (in chronological terms) to changes in interest rates. Securities with longer maturities and less frequent payment streams are characterized by higher duration and greater interest rate risk.
10. (Appendix) Duration gap analysis allows the assessment of both the direction and magnitude of interest rate changes on bank capital given a particular duration gap. An increase in interest rates and positive duration gap will cause bank capital to fall; an increase in interest rates with a negative duration gap causes bank capital to rise. The reverse is also true. A decrease in interest rates and positive duration gap will cause bank capital to rise; an increase in interest rates with a negative duration gap will cause bank capital to fall. By matching asset and liability durations—reducing the duration gap to zero—banks insulate themselves from interest rate movements that affect their capital.

Key Terms

125s, p. **536**
Compensating Balance, p. **536**
Credit Rationing, p. **539**
Credit Report, p. **538**
Credit Reporting Agencies, p. **538**
Credit Score, p. **538**
Debt-to-Income Ratio, p. **534**
Duration Analysis, p. **555**
Duration Gap Analysis, p. **557**
Five Cs of Credit, p. **533**
Housing-to-Income Ratio, p. **534**
Income Gap, p. **544**
Income Gap Analysis, p. **545**
Insolvent, p. **533**
Liquidity Ratio, p. **547**
Loan Commitments, p. **541**
Loan Participation, p. **541**
Loan-to-Value Ratio, p. **535**
Negative Spread, p. **533**
Positive Spread, p. **532**
Price Risk, p. **554**
Reinvestment Risk, p. **554**
Risk-Based Pricing, p. **538**
Securitization, p. **542**

Review Questions

1. What are the main objectives of the asset-liability committee and how does it pursue these goals?
2. Define default risk. What are the Five Cs of credit? List and explain each. What three ratios can be used to assess two of these five elements of default risk?
3. Why are 125s so popular if they created negative equity and increased the risk of default?
4. What is the difference between collateral and capital?
5. List and explain the four steps of effective credit-risk management.
6. Explain the differences between a credit report, a credit score, and credit rationing.
7. How can loan participations and securitization be used to reduce default risk?
8. What are the two problems that cause bank managers to be concerned about higher interest rates?
9. What are the two ways higher interest rates increase adverse selection?
10. If a bank is characterized by a positive income gap and interest rates rise, what will happen? What will happen if the bank is characterized by a negative income gap and interest rates rise? How would your answer to these questions change if we assumed that interest rates were falling? How can banks insulate themselves from the threat posed by volatile interest rates on bank income?
11. What is liquidity risk? How can it be managed on the liability side of the balance sheet? What can be done on the asset side of the balance sheet to ease illiquidity pressures?
12. (Appendix) What is the difference between price risk and reinvestment risk? How are these two concepts related to duration analysis?
13. (Appendix) If a bank is characterized by a positive duration gap and interest rates rise, what will happen? What will happen if the bank is characterized by a negative duration gap and interest rates rise? How would your answer to these questions change if we assumed that interest rates were falling? How can banks insulate themselves from the threat posed by volatile interest rates on capital?
14. Go to http://minneapolisfed.org and search for "interest rate risk" and locate the article entitled "Interest Rate Risk: What Is It, Why Banks Would Want It, and How to Evaluate It" from the July 2000 edition of the *Fed Gazette*. Answer the following questions based on your reading of this article. Why is the Fed interested in interest rate risk (IRR)? What do the authors mean when they say "Think of IRR as blood pressure for banks"? Why do banks refuse to eliminate IRR? What happened to IRR in the commercial banking industry from 1998 to 1999? (Hint: Be careful in analyzing both the diagrams and their discussion.)

Analytical Questions

15. Discuss the costs and benefits of credit scoring. Is anyone hurt by credit scoring?

Use the following balance sheet for First ITP Bank to answer questions 16–18.

Assets		Liabilities	
Reserves and cash	$50 million	Checkable deposits (fixed rate)	$25 million
Securities		Money Market deposit accounts	$25 million
Less than 1 year	$40 million	Savings deposits (fixed rate)	$25 million
Greater than 1 year	$10 million	CDs	
Commercial loans		Variable rate	$25 million
Less than 1 year	$10 million	Less than 1 year	$35 million
Greater than 1 year	$40 million	Greater than 1 year	$15 million
Residential mortgages		Fed funds	$10 million
Variable rate	$25 million	Other borrowing	
Fixed rate	$25 million	Less than 1 year	$30 million
		Greater than 1 year	$35 million
All other assets	$50 million	Bank capital	$25 million
Total assets	$250 million	Total liabilities and capital	$250 million

16. Using data from the ITP balance sheet, what is its current income gap? Given this answer, what will happen to bank income if interest rates fall?
17. Given your answer to the first part of question 16 and assuming a 5 percentage-point increase in interest rates, by what magnitude will bank income change?
18. What is the liquidity ratio for First ITP Bank? Is this unusually high? How do you know?
19. Assume that First ITP bank customers have unexpectedly increased their use of previously unused credit card balances and home equity lines of credit. What can the bank do to meet this unexpected and unplanned rush for liquidity?
20. (Appendix) Suppose that First ITP Bank's research staff has determined that the average duration of the bank's assets equals 1.9 years and the average duration of its liabilities equals 3.4 years. What would be its duration gap?
21. (Appendix) Given your answer to question 20 and assuming that interest rates increase from 8 percent to 10 percent, what would happen to First ITP Bank's net worth?

Suggested Readings

As the subprime mortgage meltdown of 2007 became the financial crisis of 2008, the stock of one economist rose while all else was falling. Nouriel Roubini's Web site, RGE Monitor, became the place to find up-to-date, provocative viewpoints regarding the crisis as it unfolded. Dr. Roubini had predicted a crisis before it happened, and in so doing developed a reputation as one with a unique but valuable viewpoint on financial markets. What he first developed as a Web site to collect and distribute information regarding the Asian financial crisis of 1997 has developed in to a general site for information on global finance, available at **www.rgemonitor.com.**

In his book, *The Black Swan: The Impact of the Highly Improbable*, Nassim Nicholas Taleb presents an original and idiosyncratic view of statistics and finance. One of his basic points is that unforeseeable events add a dimension of uncertainty to the world, and to finance, which cannot be captured by mathematical and statistical modeling. His thinking echoes the Will Rogers quote we use to begin this chapter, "It ain't what you don't know that will hurt you, it's what you think you know that ain't so." One of the many points made by Mr. Taleb is that the sophisticated modeling used in modern finance causes people to think they know more than they actually do, and this can be economically dangerous.

Are credit scores useful for measuring relative levels of risk by mortgage loan applicants and existing mortgage holders? Robert B. Avery, Raphael W. Bostic, Paul S. Calem,

and Glenn B. Canner think so. In their "Credit Risk, Credit Scoring, and the Performance of Home Mortgages" (*Federal Reserve Bulletin*, July 1996, pp. 621–664), they provide a comprehensive overview of the connections among credit risk, credit scoring, and loan performance. Despite an overemphasis on mortgage loan denials rather than differences in mortgage pricing, their work provides valuable insights into how credit scores can be used to predict the likelihood of a borrower's delinquency and/or default. In contrast, the January 2001 issue of *Consumer Reports*, "New Assault on Your Credit Rating" (www.consumerreports.org) suggests that the increased use of credit scoring and lenders' refusal to share credit scores leaves borrowers at an unfair disadvantage. (Credit scores have recently become available to consumers.) The article explains how the "tiering" of credit quality scores affects the interest rates charged and provides tips for consumers to protect themselves from subprime lenders.

Methods to manage interest rate risk have changed over time. In this chapter and its appendix, we highlight two of the most common techniques—gap and duration analysis. Steven Davidson, in a January 1996 *America's Community Banker* article entitled, "Measuring Interest Rate Risk," explains a new method for measuring interest rate risk in investment securities portfolios. The method, risk point analysis, assesses how changes in the shape of the yield curve affect the value of particular portfolios as well as instruments within them.

In the May 2000 (no. 00–01) issue of the FDIC's *Bank Trends*, Allen Puwalski explains the reasons for and implication of interest rate risk at certain institutions in "Increasing Interest Rate Risk at Community Banks and Thrifts." He argues that during the 1990s, the average maturity of bank and thrift assets has been rising. At the same time, these lenders have increasingly relied on volatile liabilities. Together these trends threaten both bank income and market values.

The State of Utah Department of Financial Institutions Web site gives a simple example of debt-to-income ratio, as well as providing links to other relevant finance sites: **www.dfi.state.ut.us/dtiratio.htm.**

Appendix
Risk Assessment with Duration and Duration Gap Analysis

Income gap analysis is a powerful technique for examining the effects of interest rate changes on a bank's income. But what if we want to know the effect of interest rate changes on the value of a bank's assets, liabilities, and net worth? There are two possible threats to a bank's portfolio when interest rates change: price risk and reinvestment risk. **Price risk** is the threat that an increase in interest rates will reduce the market value of our bond and loan portfolio. **Reinvestment risk** is the threat that falling interest rates will reduce future rates of return on our reinvested cash flows. These risks move in opposite directions. Higher interest rates will decrease the present value (the price) of security holdings. However, the higher rates will allow us to earn a higher return on those funds we reinvest. Similarly, lower interest rates will increase present values (our asset prices) but cause returns on current and future investments to be lower.

Price Risk
The threat that an increase in interest rates will reduce the market value of security holdings.

Reinvestment Risk
The threat that falling interest rates will reduce future rates of return on current and future cash flows.

Bond prices and interest rates move in opposite directions. The price of long-term bonds will fall by more than the price of short-term bonds given the same increase in interest rates. Banks also face this price risk problem. If interest rates rise, the present value (and market value) of the loans and securities in their portfolios will fall. However, not all of the assets will fall by the same degree. If interest rates increase, the present value of their loans with long outstanding maturities is going to decrease more rapidly than their short-term securities or loans. Equation (22–5) illustrates this relationship. This equation was first introduced as Equation (5–6) with slightly different notation.[6] We use this slightly more complicated notation format here to explain the concept of duration.

$$\text{Present value} = \sum_{t=1}^{n} \frac{CP_t}{(1+i)^t} \tag{22–5}$$

where

CP_t = the future stream of cash payments (principal and/or interest) made at time t
i = interest rate
n = number of years until the loan or security matures

The interest rate is in the denominator of this equation, so when interest rates rise, present value must fall. Similarly, when interest rates fall, present value must rise.

Two examples of present value calculations are illustrated in the top and bottom parts of columns 3 and 4 in Exhibit 22–1A.[7] Here we compare two securities with face values of $10,000 and a coupon rate of 10 percent. They differ only by their maturities. The security in the top half of the table matures in 5 years while the security in the bottom part of the table matures in 10 years. Column 3 shows that both have a present value of $10,000 when prevailing interest rates remain at 10 percent. However, column 4 shows that if interest rates rise to 20 percent, the 5-year note falls in value to $4,605.6 and the 10-year note falls even further to $4,234.60, a difference of $371.07. When we remember that securities trade at their present value (adjusting for risk and preferred habitats), we can see that the market or resale values of these instruments are going to fall as well. If the changes in interest rates cause the asset side of the balance sheet to fall by more than the bank's net worth—its level of capital—the bank will become insolvent. Thus, interest rate risk is a threat not only to bank income, as we explained with income gap analysis, but also to the net worth and solvency of an institution.

Given these implications, we can see why bankers needed to develop a measure of how responsive the value of a bank's assets and liabilities is to changes in interest rates. The basic measure is called **duration analysis** and is illustrated in column 6 of Exhibit 22–1A. Its calculation requires a bit of algebra, but bankers and financial analysts get paid for more than their golf game. Duration can be computed for an individual asset or liability. To compute the duration for an entire portfolio requires using a weighted average of all loans and securities in a portfolio. A common form for computing duration—called Macaulay duration after its inventor—is shown in Equation (22–6). It states:

Duration Analysis
A measure of interest rate risk that seeks to measure how responsive the value of a bank's assets, liabilities, and net worth are to changes in interest rates. Duration is reported in chronological terms.

$$\text{Duration} = \frac{\sum_{t=1}^{n} (t) \frac{CP_t}{(1+i)^t}}{\sum_{t=1}^{n} \frac{CP_t}{(1+i)^t}} \tag{22–6}$$

where

CP_t = the future stream of cash payments (principal and/or interest) made at time t
(t) multiplies the present value in each period by the number of each year
i = interest rate
n = number of years until the loan or security matures

At first glance, the equation appears complex, but it can be programmed easily into a spreadsheet and explained with an example like that shown in columns 5 and 6 of Exhibit 22–1A. The numerator (the top part) of this equation is the present value formula from Equation (22–5) multiplied by each year, or sum of the present values weighted by the time periods when realized. The denominator (the bottom half of Equation 22–6) is Equation (22–5), the unweighted sum of present values. This adjustment by (t) and the denominator adjusts our numerator for two things. First, the (t) adjusts for the share each payment contributes to the total present value. We illustrate this in column 5

22-1A
Present Value, Interest Rates, and Duration

One can see by comparing the top and bottom totals of column 3 that notes that differ only by their maturity have the same present value (they both equal $10,000). An examination of the top and bottom totals of column 4 shows how an increase in interest rates (from 10 percent to 20 percent) have a larger adverse effect on the 10-year security than on the 5-year security. (The 5-year note falls in value to $4,605.67 while the 10-year note falls to $4,234.60.) Similarly, by comparing the top and bottom totals of column 6, we can see that the longer-term security has a significantly higher duration (6.759) than does the shorter-term security (4.170).

Detail for a $10,000 Note with a Coupon Rate of 10 Percent and a 5-Year Maturity

1	2	3	4	5	6
Year	Annual Cash Payments of Interest and Principal in $	Present Value (PV) of Cash Payments (i = 10%) in $	Present Value (PV) of Cash Payments (i = 20%) in $	Weights (share of Total Present Value = PV/10,000) in Percentage Terms	Duration: Weighted Maturity in years
1	$1,000	$909.09	$833.33	9.09%	0.091
2	1,000	826.45	694.44	8.264	0.165
3	1,000	751.31	578.7	7.513	0.225
4	1,000	683.01	482.25	6.83	0.273
5	1,000	620.92	401.88	6.209	0.310
5	10,000	6,209.21	1,615.06	62.092	3.105
Totals	$15,000	$10,000	$4,606	100	4.170

Detail for a $10,000 Note with a Coupon Rate of 10 Percent and a 10-Year Maturity

1	$1,000	$909.09	$833.33	9.09%	0.091
2	1,000	826.45	694.44	8.264	0.165
3	1,000	751.31	578.7	7.513	0.225
4	1,000	683.01	482.25	6.83	0.273
5	1,000	620.92	401.88	6.209	0.310
6	1,000	564.47	334.9	5.645	0.339
7	1,000	513.16	279.08	5.132	0.359
8	1,000	466.51	232.57	4.665	0.373
9	1,000	424.1	193.81	4.241	0.382
10	1,000	385.54	161.51	3.855	0.386
10	10,000	3,855.43	42.13	38.554	3.855
Totals	$20,000	$10,000.00	$4,234.60	100.00%	6.759
Difference			**–$371.07**		**+2.589**

of Exhibit 22–1A. Second, the denominator converts the dollar figures into a measure of years. This is the weighted average maturity of the present value of the cash flows: duration. We illustrate this in column 6 of Exhibit 22–1A. The note with the 10-year maturity has a higher duration—6.759 years compared to the 4.170 years of the 5-year security. Securities or loans that make less frequent periodic payments (compared to those with more frequent payments) are also characterized by higher durations.

Understanding what duration for an individual security means requires us to reconsider price and reinvestment risk. The duration of the 5-year note shown in Exhibit 22–1A is 4.170. This means that after 4.17 years, this note will have yielded a 10 percent return, regardless of changes in the interest rate. After this point in time, any increase in the interest rate, which normally would decrease the security's present value, will be offset by the increased investment returns on the security's past and future cash payments. The reduction in value caused by an increase in the interest rate—the price risk—is offset by an increase in value from previous and future reinvested cash payments—the reinvestment risk—made by the security. While the 5-year note reaches this point after only 4.17 years, the 10-year security fails to reach this point until 6.759 years have expired. The longer-term security, thus, presents its holder with more interest rate risk than does the shorter-term security. The same phenomenon would apply if our object of analysis were a loan instead of a note.

Applying Duration to Portfolios and Capital Management

The preceding examples involve computations for individual assets. By computing the duration for each instrument on our balance sheet and multiplying it by its share of the balance sheet's total asset value, we can arrive at a weighted-average duration measure for our assets and our liabilities.[8] By subtracting the weighted average of our liability duration from the weighted average of our asset duration, we arrive at a new measure called **duration GAP analysis,** described in Equation (22–7).[9]

Duration GAP Analysis
A type of duration analysis that involves subtracting the duration of a bank's interest-rate-sensitive assets from its interest-rate-sensitive liabilities

$$\text{Duration Gap} = DURAs - DURLs \tag{22–7}$$

where

DURAs = the average duration of our assets
DURLs = the average duration of our liabilities

Our financial analysis department has undertaken this process for the balance sheet of First South-Western Bank introduced in Exhibit 22–1. The analysis yielded:

DURAs = 3.2
DURLs = 1.4

Applying Equation (22–7) yields:

Duration Gap = 3.2 – 1.4
Duration Gap = 1.8

When duration gap is positive, as in this example—the typical case for banks—it means that the market value of the bank's assets is more sensitive to changes in interest rates than are its liabilities. You can see this because of the higher average duration on assets than on liabilities. If duration gap is positive and if interest rates rise, asset values will fall more rapidly than liability values. This is a problem! Since net worth, or capital, equals assets minus liabilities, a positive duration gap and rising interest rates mean that bank capital will fall. This was the problem with S&Ls during the early 1980s. In contrast, a positive gap coupled with falling interest rates will cause bank capital to increase. The larger the duration gap, the stronger these tendencies.

In the opposite case, when a financial institution is characterized by a negative duration gap, rising interest rates will decrease bank capital as the value of assets falls more quickly than that of liabilities. Similarly, a negative duration gap combined with

22-2A

The Effects of Duration Gap and Interest Rate Changes on Bank Capital

Interest Rate Change	Positive Duration Gap	Negative Duration Gap	Zero Duration Gap
	Interest-rate- sensitive assets are greater than interest-rate-sensitive liabilities (DURAs>DURLs)	Interest-rate- sensitive assets are less than interest-rate-sensitive liabilities (DURAs<DURLs)	Interest-rate-sensitive assets are equal to interest-rate-sensitive liabilities (DURAs=DURLs)
Interest rates increase	Bank capital falls	Bank capital rises	Bank capital is unchanged
Interest rate decrease	Bank capital rises	Bank capital falls	Bank capital is unchanged

falling rates causes bank capital to swell. If a bank insulates itself from interest rate risk by matching the duration of its assets and liabilities, changes in interest rates will have no effect on bank capital. The relationships among duration GAP, interest rate movements, and bank capital are summarized in Exhibit 22–2A.

As with income GAP analysis, duration GAP analysis can also be used to discern not only the direction in which the value of bank capital moves when interest rates change, but also to estimate the magnitude of the change. Equation (22–8) explains how we can take the duration GAP computed in Equation (22–7) and multiply it by the percentage change in the interest rate to determine how much the bank's net worth—its capital—will change due to a given change in the interest rate.

(22–8) $\%\Delta NW$ equals approximately $-$ duration gap $\times \{\Delta i/(1 + i)\}$

where,

$\%\Delta NW$ = the percent change in the bank's net worth
i = interest rate

In Equation (22–7) we computed a positive duration gap of 1.8. Let us also assume that interest rates are expected to increase from 10 percent to 20 percent.

$$\%\Delta NW = -1.8 \times 10/1.1$$

(22–9) $$\%\Delta NW = -16.364\%$$

This means that the bank's net worth, its capital, will fall by 16.364 percent. To convert this into dollar terms, we take the –16.364 percent and multiply it by First South-Western Bank's level of capital ($50 million) ($500 million) (Exhibit 22–1).

$$-0.16364 \times \$500 \text{ million} = -\$8.18 \text{ million}$$

This yields a loss of about $8.18 million. Given that First South-Western only had $50 million worth of capital to start with, this hypothetical doubling of interest rates would lead to a 16.3 percent drop in bank capital ($8.18 million/$50 million = 16.3 percent).

Thus, if management expects a sharp rise in future interest rates, it is time for First South-Western to take aggressive action.

Managing Interest Rate Risk in Response to Duration Gap Analysis

If First South-Western's asset-liability committee thought that interest rates were going to rise, it could have attempted to reduce its positive duration gap and thereby reduce its interest rate risk. This could be done by increasing the average duration of its liabilities or decreasing the average duration of its assets. How might that be done? A lengthening of the liability portfolio could be done by using more long-term CDs and borrowings rather than relying on short-term fed funds or money market deposit accounts as sources of funds. Asset duration could be shortened by holding a larger share of short-term and/or variable rate assets. In short, by matching the bank's asset duration to its liability duration, banks are able to insulate themselves from movements in interest rates that positively or negatively affect their capital positions. As we will see in the next two chapters, there are other instruments and techniques that can be used to avert this type of calamity without restructuring a bank's balance sheet.

Recap

Changes in interest rates threaten not only bank income as described with income gap analysis, they also threaten the value of a bank's assets, liabilities, and capital. Increases in interest rates pose a price risk by lowering the present value of asset holdings. Similarly, falling interest rates pose a reinvestment risk by lowering the returns received on current and future investments. These types of interest rate risk can be assessed using duration analysis and duration gap analysis. Duration gap analysis measures the responsiveness of a bank's assets, liabilities, and net worth (in chronological terms) to changes in interest rates. We find that securities with longer maturities and less frequent payment streams are characterized by higher duration and interest rate risk. Duration gap analysis allows us to assess both the direction and magnitude of interest rate changes on bank capital given a particular duration gap. In the usual case, a positive duration gap combined with an increase (decrease) in interest rates causes bank capital to fall (rise). A negative duration gap combined with an increase (decrease) in interest rates causes bank capital to rise (fall). By matching asset and liability durations—reducing the duration gap to zero—banks can insulate themselves from interest rate movements that affect their capital.

Endnotes

1. For details, see the article entitled "Credit Risk, Credit Scoring, and the Performance of Home Mortgages" by Robert B. Avery, Raphael W. Bostic, Paul S. Calem, and Glenn B. Canner in the *Federal Reserve Bulletin*, July 1996, p. 624.
2. Of course, just the opposite occurred in the early 1990s. When interest rates fell, bank profitability rose, averting a bailout of the commercial banking system from its deposit insurance crisis.
3. In more sophisticated forms of income gap analysis, analysts estimate the portion of long-term commercial loans and fixed-rate mortgages that are likely to be refinanced in the event of falling interest rates. Look back at the balance sheet in Exhibit 22–1. By examining historical

data, an analyst might estimate that 10 percent of long-term (greater than one year) commercial loans ($8 million) and 20 percent of fixed-rate mortgages ($10 million) are repaid during the year. Thus, these assets should also be considered interest rate sensitive. Combining this $18 million of interest-rate-sensitive assets to the $150 million brings our adjusted total of interest-rate-sensitive assets to $168 million. This same reasoning applies on the liability side. Assume that our analyst determines that 20 percent of First South-Western's checkable deposits ($10 million) and 50 percent of its savings deposits ($25 million) should be considered interest rate sensitive. Adding these adjusted totals to our analysis brings our total to $285 million of interest-rate-sensitive liabilities. Applying Equation (22–1) yields a recomputed gap of $168 million – $285 million = –$117 million. If we use Equation (22–2) and assume a similar 3 percent increase in the interest rate, we find an expected decrease in income of $3.51 million (–$117 million × 0.03 = –$3.51 million). Gap analysis has become increasingly sophisticated over the last several decades. However, the basic equations here have not been fundamentally changed. Instead, improved estimation techniques and refinements in determining and matching the maturity of instruments to various time periods have improved the data used in the equations.

4. Increased use of variable-rate mortgages is a great way to take advantage of expected increases in interest rates and manage interest rate risk. The downside is that this also increases the bank's exposure to default risk. Higher future interest rates will increase the likelihood that some variable-rate mortgage borrowers will be unable to meet their higher debt-payment obligations.
5. There are a multitude of various refinements to this technique. Many analysts include checking and savings deposits (or some fraction thereof) in the computation of short-term liabilities and, thus, the liquidity ratio. We have excluded them here for ease of exposition and clarity. This measure can also be referred to as a gap ratio and used as a measure of interest rate risk.
6. Equation (5–6) was introduced in this form: $P = C_1/(1+i)^1 + C_2/(1+i)^2 + \cdots + C_n/(1+i)^n + F/(1+i)^n$ where P = the price (present value) of the bond, C = the coupon payment on the bond (C_1 in year 1, C_2 in year 2, etc.), F = the face or par value of the bond, i = the interest rate, and n = the number of years to maturity (on a 5-year bond, $n = 5$). Here we have generalized the separate coupon payment (C) and face value of the bond (F) into one variable called future cash payments (CP). We also use t instead of n to denote the passage of time.
7. We engage in a minor distortion of reality here to make two points. Under the normal circumstances of an upward-sloping yield curve, the interest rate for the ten-year note would be higher than the rate for the five-year note. Here, we have imposed a flat yield curve to illustrate the following: (1) how increases in interest rates adversely affect the value of securities that differ only by their maturities, and (2) how duration differs for these same two securities. Our distortion plays no material role in these illustrations, but it does make the comparison easier to examine.
8. Note: We are talking about making a weighted average of duration, which is itself a weighted average maturity of our cash flow's present value.
9. This equation could be restated as duration gap = duration of assets – (market value of liabilities/market value of assets) × duration of liabilities. To make your life easier, we allow you to subtract the average durations. This avoids the extra step of (1) dividing the market value of the assets by the market value of the liabilities and then (2) multiplying this fraction by the liability duration.

CHAPTER TWENTY-THREE 23

Never let the future disturb you. You will meet it, if you have to, with the same weapons of reason which today arm you against the present.

—Marcus Aurelius

Forward, Futures, and Options Agreements

Learning Objectives

After reading this chapter, you should know:

The difference between a forward contract and a futures contract

The scope and nature of organized financial futures and options markets

The relationship between spot and futures prices

The difference between put and call options

The reasons for the astounding growth of financial forward, futures, and options agreements in recent years

A SINGLE SOLUTION

It is 5:10 P.M. on Friday, the last day of a month in late 2009. The CEO's meeting with his staff has run later than usual, and a sense of uneasiness pervades the room. Doz-All, a newly emerging conglomerate, is involved in diversified financial and manufacturing areas. The mortgage banking division has committed to make $10 million in loans at 7 percent to be funded in 60 days; $25 million in bonds issued 10 years ago for start-up money is maturing in three months, and the company plans to pay off the existing bondholders by issuing new bonds. The newly formed international division is converting $20 million to Japanese yen to invest in Japanese securities over the next few months. The stock adviser points out that although the corporation has a diversified stock portfolio, there is a general fear that the market may be heading down.

All of these situations expose the corporation to risks—the risks that interest rates (and hence bond prices), stock prices, or foreign exchange rates will move in an unexpected direction, causing the corporation to experience a loss. The senior vice president appears tired. She cannot help but perceive that the risks associated with everyday business seem to have escalated in recent years.

In the past two decades, financial prices such as interest rates, stock prices, and exchange rates have become more volatile. This increased volatility has created greater risks.[1] The chief financial officer (CFO) is a young business school graduate whom senior management has come to rely on. He assures them that there are ways to deal with the increased risk, although doing so will cost money. In this case, however, his recommendations are the source of the tension felt in the room. To reduce Doz-All's risk exposure, the CFO is recommending that the corporation use the financial forward, futures, or options markets. In days long past, futures and options on agricultural products and commodities were considered to be highly risky, and forward agreements, which could be costly, had other drawbacks. Could the new financial forward, futures, and options markets that have emerged in the past 30 years actually be used to reduce or manage the risks inherent in everyday business?

In this chapter, we explore financial forward, futures, and options contracts. We shall see that risk-averse financial intermediaries and corporations increasingly use these markets in their everyday business for just this purpose—to reduce the risks associated with price fluctuations. The adage "necessity is the mother of invention" aptly applies, because financial forward, futures, and options markets have experienced incredible growth in the past three decades in response to increased price volatility.

FORWARD TRANSACTIONS

Financial Forward Contract
An agreement in which the terms, including price, are completed today for a transaction that will occur in the future.

A **financial forward contract** is an agreement between two parties to buy or sell an agreed-upon amount of a financial asset on a date in the future at a price determined today. Financial forward transactions can be used to hedge the risks associated with price changes of any financial instrument. Although virtually all financial prices have become more volatile in recent decades, forward agreements are primarily and most widely used to deal with the risks created by price fluctuations in foreign exchange markets. Thus, foreign exchange forward markets are the focus of this section.

The exchange rate is the price of one currency in terms of another. As you have seen in earlier chapters, *exchange rate risk* is the risk that changes in the exchange rate will cause someone to experience unexpected losses. The more unpredictable and unstable that exchange rates are, the greater the exchange rate risk is. Exchange rates have become much more volatile since the major industrialized countries adopted the flexible exchange rate system in 1973.[2] Also, as international trade has increased and as financial

markets have become more globalized, the demand for foreign financial instruments has soared. This has led to the increased trading of foreign currencies with more volatile prices and a dramatic increase in exchange rate risk for market participants. These participants have found ways to **hedge** this greater exchange rate risk through the development of forward markets.

Hedge
An investment made to reduce risk.

In Chapter 8, we discussed how exchange rates are determined by supply and demand in the foreign exchange market. In that chapter, we were referring to *spot rates*—that is, the exchange rates of foreign currency for immediate delivery. In financial forward agreements, the terms (including prices and amounts) are completed today for a transaction that will occur on a specified date in the future. Financial intermediaries, acting as brokers or agents, can link up two parties in a forward transaction. As noted earlier, the most common type of financial forward agreement is the forward agreement in foreign currencies (foreign exchange). These agreements have been highly developed by large commercial banks to provide services to their customers who will need or receive foreign currencies on a future date. In this case, the bank is one of the two parties in the forward transaction. Commercial banks also sometimes hold large amounts of foreign currencies and hence can use forward markets to hedge their own exchange rate risk.

Large banks have many customers that operate on a global basis. These customers may know that they will receive and/or need foreign currencies on a future date. The foreign currencies are used by the bank's customers to purchase or to pay for goods, services, and financial instruments. For example, perhaps one U.S. company will be liquidating its holding of French stocks in six months to pay off a maturing domestic bond issue, while another U.S. company plans to increase its investment in Europe. The first company will be receiving euros; the latter company will need euros. Another customer may be an importer, an exporter, or a securities firm that sells domestic and foreign financial instruments globally. Large banks buy and sell not only foreign exchange at spot rates for present delivery but also foreign exchange for future delivery at a **forward rate.** The forward rate for a foreign currency will gravitate toward the *expected* future spot exchange rate for that currency. The forward rate is affected by the same factors that affect spot rates as discussed in Chapter 8. These factors, which affect the supply and demand for foreign exchange, include expected inflation and interest rate differentials between the two countries, the economic outlook in both countries, and domestic and foreign monetary and fiscal policies. The forward rate can be used as a market-based forecast of the future spot rate.

Forward Rate
The price today for a delivery on a future date.

A bank buys foreign exchange forward agreements from some customers and sells foreign exchange forward agreements to others. The bank engages in these forward agreements to earn profits and to provide a service to its customers who wish to hedge the exchange rate risk. The profit comes from buying the currency at one price, the bid price, and selling the currency at a slightly higher price, the asked price. Large banks have a long history of providing exchange facilities for foreign currencies as a service to their customers. These currency exchange facilities predate flexible exchange rates. Forward agreements arranged by large banks were a natural outgrowth of this trade-facilitation service under the post-1973 flexible exchange rate system.

A typical foreign exchange forward agreement works as follows: The forward agreement is a contract with a bank to purchase or sell on a future date a specific amount of foreign exchange at a forward rate (exchange rate) determined today.

For example, assume that a customer of Citibank is to receive 1 million euros in six months and another customer will need 1 million euros in six months. Both customers know the present spot rate but are worried that unknown future changes in the exchange rate could reduce their profits. Citibank can enter into a forward agreement with each that will hedge this risk. The agreements will also earn a small profit for Citibank. Just as in spot markets, Citibank buys forward contracts at one rate and sells forward contracts at a

slightly higher rate. The difference between the bid and asked prices represents the profit margin on the transaction. If the forward rate for Citibank to buy euros from a customer with a delivery date in six months is 1 euro = $1.559, then 1 million euros can be sold to the bank by a customer for $1,559,000 (1,000,000 × 1 euro = 1,000,000 × $1.559). Thus, 1 euro=$1.559, which is the bid price.[3] A customer that will be receiving 1 million euros in six months may enter into this transaction to reduce the risk that the euro will depreciate and that she will receive fewer than $1,559,000 in exchange for the 1 million euro. For example, if the euro depreciated to 1 euro=$1.558, then, without the forward agreement, the customer would be able to sell the euro for only $1,558,000 instead of $1,559,000.

Assume that the forward rate (exchange rate) for Citibank to sell euros with a delivery date in six months is 1 euro = $1.560. This is the forward asked price. A customer who will need 1 million euros in six months may enter into a forward agreement in order to reduce exchange rate risk. The 1 million euros will cost the customer $1,560,000 (1,000,000 × 1 euro = 1,000,000 × $1.56) in six months. A customer needing 1 million euros in six months may enter into this transaction to reduce the risk that the euro will appreciate and that he will have to pay more than $1,560,000 for 1 million euros. For example, without the forward agreement, if the euro appreciated to 1 euro = $1.565, then 1 million euros would cost the customer $1,565,000 instead of $1,560,000.

The profit to Citibank in the forward markets is, as noted previously, just as in spot markets: Citibank buys at one forward rate (the bid price) and sells at a slightly higher forward rate (the asked price). The bank makes a profit on the difference between the bid and asked prices multiplied by the number of euros bought and sold. In this case, the profit on the forward transactions in 1 million euros is $1,000 ($1,560,000 – $1,559,000). Exhibit 23-1 highlights these relationships.

The one-, three-, and six-month forward rates for major foreign currencies such as the euro, the British pound, the Canadian dollar, the Japanese yen, and the Swiss franc are reported daily in *The Wall Street Journal*, along with the spot exchange rates. The accompanying "Cracking the Code" feature on p. 565 discusses how to read the spot and forward exchange rates reported by the *Journal*. Note that for both spot and forward rates, only one exchange rate is reported. This is the midrange rate between the bid and the asked prices.

If the bid and asked spot exchange rates six months from now are equal to the current forward rates, the customers both buying and selling forward agreements would be no better or no worse off financially. In addition, they may have slept more soundly at night because of the reduced exchange rate risk. In six months, the actual bid and asked spot exchange rates may be more or less than the forward rates today. In this case, one of the customers will be worse off and one will be better off than without the forward agreement, depending on how rates diverged from what was expected. However, both customers are willing to give up the opportunity to gain in exchange for reducing the risk of being worse off.

23-1
Citibank Engages in Forward Agreements

6-Month Forward Rates Today

Bid (buy) Price	Asked (sell) Price
1 euro=$1.559	1 euro=$1.560
1,000,000 euros=$1,559,000	1,000,000 euros=$1,560,000

Profit to Citibank from buying and selling 1,000,000 euros at today's forward rates = $1,000 = ($1,560,000 – $1,559,000).

Cracking the Code

Foreign Exchange Spot and Forward Rate Quotations

The following foreign exchange quotations for Friday, March 8, 2008, were reported in *The Wall Street Journal* on Monday, March 10, 2008. Spot rates are reported for about 180 countries, but forward rates are reported for only the major foreign currencies including the British pound, the Canadian dollar, the Japanese yen, and the Swiss franc. For both spot and forward exchange rates, the rate that is reported is the midrange rate between the bid and the asked prices. The name of the country and its currency appear in column 1. Column 2 gives the midrange rates for the current day in terms of U.S. dollars per unit of foreign currency. Column 3 gives the midrange rates in terms of foreign currency per U.S. dollar.

For example, the Column for six-month forward rate for the British pound is highlighted. On Friday, March 8, 2008, the midrange of the six-month forward bid and asked rates was 1 British pound=$1.9857. Column 3 is merely the reciprocal of column 2. Thus, on March 8, 2008, the six-month forward rate was $1=.5036 British pounds (1 British pound/$1.9587=$1.9587/$1.9587=$1). The final column gives the year-to-date percent change in the U.S. dollar. In this case, since the beginning of 2008, the change in the six-month forward dollar rate was negative. Thus, the six-month forward rate has depreciated 0.5 percent against the British pound. Note that the spot rate of the British pound (top row) depreciated 1.4 percent over the same period.

Country/ currency	**Fri, March 8, 2008**		**US$ vs. YTD chg**
	in US$	per US$	(%)
UK (Pound)	2.0146	.4965	–1.4
1-mo forward	2.0100	.4975	–1.2
3-mos forward	2.0005	.4999	–0.9
6-mos forward	***1.9587***	***.5036***	***–0.5***

Source: The Wall Street Journal (March 10, 2008): C11.

The problem is that today it is not known which one will lose and which one will gain without the forward agreement. Both customers can reduce the uncertainty of the future exchange rate by engaging in a forward agreement with Citibank today. Thus, for reducing the possibility of a loss, they are both giving up the opportunity to gain. However, as noted earlier, the forward rate will converge to the market's general expectation of the future spot rate. Thus, market participants will give up the opportunity to gain only if there were unexpected changes in the future spot rate.

An example may help to clarify. As depicted in Exhibit 23-2, assume the current bid and asked spot rates in six months are 1 euro=$1.549 and 1 euro=$1.550. This is different from the respective forward rates of 1 euro=$1.559 and 1 euro=$1.560 of six months previous. Without the forward agreement, Customer A, receiving the 1 million euros, would be able to exchange them for only $1,549,000, or $10,000 less than the $1,559,000 the euros could be exchanged for with the forward agreement. This customer would be better off with the forward agreement and worse off without it. Without the forward agreement, Customer B, needing or buying the 1 million euros, would pay only $1,550,000, or $10,000 less than the $1,560,000 the euro would cost if she entered into the forward agreement. This customer would be worse off with the forward agreement and better off without it. However, because the future rate is uncertain, with the forward agreement both have hedged the risk of being worse off.

Any market participant who holds supplies of foreign currencies is exposed to exchange rate risk. This includes financial and nonfinancial firms that operate in many countries with many different currencies. Because the forward agreements arranged between banks and their customers are often not perfectly offsetting matches, the bank can be exposed to an exchange rate risk. For example, if one customer is to receive

	Current Spot Rates	Forward Rates Six Months Previous
Bid	1 euro=$1.549	1 euro=$1.559
Asked	1 euro=$1.550	1 euro=$1.560

No forward agreement (exchanges at current spot rates):
Customer A receives 1,000,000 euros and exchanges them for $1,549,000.
Customer B needs 1,000,000 euros and pays $1,550,000 for them.

With forward agreement entered into six months earlier:
Customer A receives 1,000,000 euros and exchanges them for $1,559,000.
Customer B needs 1,000,000 euros and exchanges $1,560,000 for them.

Reconciling:
With no forward agreement, Customer A receives $10,000 less ($1,549,000 versus $1,559,000), and Customer B pays $10,000 less ($1,550,000 versus $1,560,000). Customer A is worse off and Customer B is better off.

With the forward agreement, Customer A receives $10,000 more ($1,559,000 versus $1,549,000), and Customer B pays $10,000 more ($1,560,000 versus $1,550,000). Customer A is better off and Customer B is worse off.

1 million euros in six months and another needs 900,000 euros in six months, the bank can still arrange the forward agreements with both, but it is then subject to an exchange rate risk on the difference between what the receiving customer will receive and what the customer who needs euros will need. In this case, the amount of exposure to the bank is for 100,000 euros (1 million euros received less 900,000 euros needed). If the euro depreciates from 1 euro=$1.55 to 1 euro=$1.54, then 100,000 euros would fall in value $1,000 from $155,000 to $154,000. Likewise, if the euro had appreciated from 1 euro=$1.55 to 1 euro=$1.56, then 100,000 euros would increase in value $1,000 from $155,000 to $156,000.

Forward agreements can also be used to speculate about future exchange rates. The speculator may be a customer of the bank or the bank itself. If the speculator thought that the future spot price in six months would be lower than the current six-month forward rate, he would enter into a forward agreement to sell foreign exchange at the higher forward rate. If the speculator was correct, he could enter the spot market in six months and purchase the foreign exchange at a lower price than he sold it for in the forward market. Likewise, if the speculator thought that the future spot price of the currency would be higher than the current forward rate, he would enter into a forward agreement to buy the currency in six months. If correct, the speculator buys the currency in the forward market at a lower price than what it can be resold for in the spot market. Indeed, it is the buying and selling by speculators that causes the forward rate to converge to the market's expectation of future spot prices.

Limitations of Forward Agreements

As you have seen, forward transactions can reduce the risks of future price changes, which reduce profit. But, as with most things in life, appearances may not reveal the whole picture. The forward market in foreign currencies works well because large banks have developed the market. For other financial instruments such as stocks and bonds, forward markets are not so highly developed. In this case, there are two general problems with arranging forward agreements:

1. Finding partners may be difficult; the transactions costs may be high and outweigh the possible gain. Finding partners who want the exact amount of the financial instrument on the exact date can be difficult at best.[4]
2. One party to the agreement may default, that is, not keep his or her part of the agreement. The party who is likely to default is the one that is worse off down the road by entering into the forward agreement earlier. Getting compliance may require legal action and may be costly if not impossible.[5]

Futures Contracts
Standardized agreements in agricultural and commodity markets to trade a fixed amount of the product or commodity on specific dates in the future at a price determined today.

Although volatile prices of financial instruments other than foreign exchange may lead to large losses that could be reduced with forward agreements, the forward markets are not highly developed. Consequently, the costs of finding a partner and then enforcing the forward contract may be prohibitively high. But all hope is not lost! To minimize the costs and risks involved with arranging forward transactions, standardized agreements called **futures contracts** have been developed for many types of financial instruments, including stocks, government securities, and foreign currencies.

Recap Forward contracts are agreements to buy or sell something at a price determined today for delivery on a later date. Forward agreements between individual market participants are arranged by intermediaries. Forward markets are not highly developed for financial instruments other than foreign currencies.

FINANCIAL FUTURES

Because agricultural and commodity markets historically have experienced large price fluctuations, futures markets in these products evolved more than a century ago. In the case of agricultural products, demand is relatively stable, and price fluctuations are related to weather: bad weather greatly reduces supply and leads to higher prices, and vice versa. Prices of commodities such as oil, copper, and gold fluctuate because of large changes in supply or demand.

Financial Futures Markets
Organized markets that trade financial futures including the Chicago Board of Trade, the Chicago Mercantile Exchange, and the London International Financial Futures Exchange.

As noted earlier, prices of financial securities, stocks, and foreign currencies have become unstable during the past 30 years. Consequently, **financial futures markets,** which trade futures in financial instruments, appeared and are now used by most major financial institutions and other large corporations to manage the risk of losses because of price fluctuations of financial instruments.

Financial Futures
Standardized futures contracts that trade financial instruments on a future date according to terms (including the price) determined today.

Financial futures are contracts in which two parties agree to trade standardized quantities of financial instruments on standardized future dates, according to the terms (including the price) that are determined today. Financial futures can be used to reduce the risk associated with future price changes of financial instruments.

Futures contracts differ from forward agreements in that the amounts and delivery dates are standardized, whereas for forward agreements they are not. Forward agreements for specific amounts and dates are negotiated with commercial banks and other financial intermediaries. Futures contracts with standardized amounts and dates are traded on the floors of organized exchanges for a small fee.

Financial futures markets trade a wide variety of contracts in underlying financial instruments such as government securities (Treasury bills, notes, and bonds), stock market indexes, Eurodollars, and numerous foreign currencies.[6] The contracts are traded on major exchanges around the world. For example, financial futures are traded on the Chicago Board of Trade, the New York Board of Trade (formerly the New York Cotton Exchange and now part of the Intercontinental Exchange), the Chicago Mercantile Exchange, the Australian Securities Exchange, and the Singapore Exchange. In early 2004, EUREX US became the first foreign-owned futures and options market to

begin trading on U.S. soil. The purpose of EUREX is to provide more direct access to investment opportunities in U.S. Treasury futures for European customers. In April 2007, EUREX merged with the New York Stock Exchange. Futures markets for various currencies and U.S. government securities are available virtually 24 hours a day, somewhere in the world. Often these markets use electronic communication networks to provide information and execute trades. Thus, as you saw in Chapter 13, the floor of the exchange may soon be replaced by a system of electronic trading where futures trading can be executed 24 hours a day in "cyberspace" from a personal computer. "A Closer Look" lists information about the most actively traded financial futures.

A futures contract trades a fixed amount of the instrument for delivery on specific dates in the future. For example, Treasury bond futures trade in contracts of $100,000 face value for delivery in March, June, September, and December over the course of the following year. There are four prices today for delivery of $100,000 of Treasury bonds on the four future dates. Likewise, Treasury bill futures, which trade in contract amounts of $1 million, are also available for delivery on the same dates at prices set today. Note that the futures contract can be bought or sold on any given day between now and the future delivery date. The predicament for the buyers and sellers is that the spot price on the delivery date may be different from the futures price agreed on today.

The seller of a September $1 million T-bill future has the right and obligation to deliver $1 million in T-bills in September for a price set today. The purchaser of the $1 million September T-bill future has the right and obligation to buy $1 million in T-bills in September at a price set today. Hence, both parties know the terms of a transaction that will occur in September, a point in time in the future, and the risk to either party of a price change between now and then is eliminated. The buyer rarely takes physical possession of the securities on the delivery date. Likewise, the seller rarely delivers. If the price changes, the buyer or the seller merely settles up financially for any changes in value.[7]

If the price of T-bills rises between now and September, the seller has given up an opportunity to make a profit because she agreed to sell at the lower futures price established today. If the spot price falls in September, the buyer has given up the right to purchase the securities at the lower price in the spot market because he agreed to the higher futures price today. Without the futures contract, however, either party could lose if the price changes in an adverse direction.

Let's consider a simple numerical example. Assume that the futures price is $96,000 for the delivery of $100,000 of Treasury bonds next December. The seller agrees to deliver, and the buyer agrees to pay this much. (Make sure you are clear that December is the *delivery date* of the securities, not their *maturity date*, which may be several years hence.) When December actually arrives, if the spot price is $97,000, the seller still must make good on the contract for $96,000, even though he could sell them for $97,000 in the spot market. The buyer still pays $96,000 for the Treasury bond contract, even though she would have had to pay $97,000 for the same contract in the spot market. In this example, the seller is worse off by $1,000, and the buyer is better off by $1,000. (Remember that the securities are not usually physically delivered, but a financial settlement is made between the buyer and the seller.)

However, if the spot price is $95,000 when December arrives, the seller gets to sell at $96,000 even though he would get only $95,000 in the spot market. The buyer has to pay $96,000 even though she could have paid $95,000 to buy in the spot market. The seller is better off by $1,000, and the buyer is worse off by $1,000. Again, a financial settlement is usually made between the buyer and the seller.

The point is that at the time of the agreement, neither party knows what the spot price will be on the future date. Both were willing to accept the known outcome as opposed to an uncertain future spot price even though after the fact one could have been

Futures, Exchanges That Trade Financial Futures, and Minimum Amounts

Consider for a moment the many types of futures markets that exist: grains and oil seeds (including corn, oats, soybeans, wheat, barley, flaxseed, and canola); livestock and meat (including cattle, hogs, and pork bellies); food and fibers (including cocoa, coffee, sugar, cotton, and orange juice); metals and petroleum (including copper, gold, platinum, palladium, silver, crude oil, heating oil, gasoline, natural gas, brent crude, and gas oil); interest rates (including 10-year agency and 10-year, five-year, and two-year U.S. Treasury notes, 30-day federal funds, Eurodollars, one-month LIBOR, Euroyen, and Treasury bonds); currencies (including Australian dollars, British pounds, Canadian dollars, euros, Japanese yen, Mexican pesos, and Swiss francs); and indexes (including Dow Jones Industrial and mini Dow Jones, NASDAQ 100, S&P Composite, and S&P Mini).[a]

Grain and commodities futures have been around for some 100 years. Financial futures including interest rate, currencies, and stock index futures are a relatively recent innovation (during the last 30 years) that has experienced tremendous growth.

The accompanying table shows some of the major financial futures and the contract size, along with the futures exchange.

Endnotes

a. Our list includes both financial and other futures because we believe you may find them interesting. Because these are information items only, we are not defining all of the terms.

Type of Future	Contract Size	Exchange* at Which Trading Occurs
Interest Rate		
10-year Interest Rate Swaps	$100,000	CBOT
10-year U.S. Treasury notes	$100,000	CBOT
2-year U.S. Treasury notes	$200,000	CBOT
30-day federal funds	$5 million	CBOT
5-year Treasury	$100,000	CBOT
Eurodollar	$1 million	CME
LIBOR—one month	$3 million	CME
Euroyen	100 million yen	CME
U.S. Treasury bonds	$100,000	CBOT
Currencies		
Australian dollar	$100,000 Australian	CME
British pound	£62,500 British	CME
Canadian dollar	$100,000 Canadian	CME
Euro	125,000 euro	CME
Japanese yen	12.5 million yen	CME
Mexican peso	500,000 pesos	CME
Swiss franc	125,000 S. francs	CME
Index Futures		
Dow Jones Industrial	$10 x DJIA	CBOT
NASDAQ 100	$100 x Index	CME
Goldman S. Index	$250 x Nearby Index	CME
U.S. Dollar Index	1,000 x Index	NYBOT
Russell 2000 Index	500 x Index	CME

*Exchanges: CBOT (Chicago Board of Trade); CME (Chicago Mercantile Exchange); NYBOT (New York Board of Trade)
Source: **http://www.barrons.com.**

Cracking the Code

Futures Prices

Toward the back of the Money and Investing section of *The Wall Street Journal*, you will find a table entitled "Futures Prices." Part of the Interest Rate Futures section of this table for Wednesday, March 12, 2008, is reproduced here. We can crack the code to futures prices by looking at the highlighted row starting on the left with April under "30 Day Federal Funds (CBT)."

The 97.665 in column 2 means that on March 12, the agreed-upon opening price for April delivery of Treasury bills was 97.665 percent of the face value of the contract. The low price for that day (column 4) was 97.650. The high for the day (column 3) was 97.695 percent, and the settle for the day (column 5) was 97.680. The .025 in column 6 indicates that there was a .025 change from the previous day. To verify this, we would have to check the preceding day's newspaper to see whether the settle price was 97.655 (97.680 – .025 = 97.655). Note that 30-day federal funds sell at a discount, which is reflected in the price being less than 100 percent of the contract amount. For the fed funds contract, the contract amount (face value) is $5 million. The open interest is the number of contracts outstanding for the month of July—in this case, 84,280.

30 Day Federal Funds (CBT)—$5,000,000; 100 daily average

		High	Low	Settle	Chg	Open Int
March	97.280	97.310	97.275	97.290	.015	65,263
April	**97.665**	**97.695**	**97.650**	**97.680**	**.025**	**84,280**

Source: The Wall Street Journal (March 13, 2008): C10.

better off without the agreement. Because the contracts are standardized with respect to type (90-day T-bills, 10-year Treasury notes, and the like) and quantity ($1 million and $100,000 contract sizes), and because volume is large, brokerage fees for buying and selling futures are relatively small.

So far, we have been discussing futures in which the parties are hedging, or reducing, the risk of a price change in the future. Futures markets can also be used for speculation. Consider the case in which ABC Government Securities (a firm that specializes in trading government securities) believes that the spot price of T-bills is going to be much higher in September than today's futures price. If ABC holds this belief firmly, it can put its money behind the belief and buy a futures contract. If ABC is correct, it can resell the futures contract at the higher spot price on the delivery date.

Contrarily, if the firm believes the price will be lower, it can sell a futures contract to make its profit. If ABC's guess is right, it can go into the spot market in September and purchase the T-bills at the lower price for immediate delivery to the buyer of the future. The difference between the futures price and what ABC pays in the spot market is its profit—ABC is good at counting this.

Futures prices are reported daily in most major newspapers. Now would be a good time to read the "Cracking the Code" feature on futures prices.

Because financial futures are written only in standardized contract amounts for delivery on a few specific dates, a perfect offsetting transaction between the buyer and seller, as in forward markets, is rarely made. For example, suppose a bank has loans that will be repaid next August and suspects that interest rates are heading down. The bank may have to reinvest the funds at a lower rate. The bank can buy a September T-bill futures contract today to hedge this risk. If interest rates do move down, the funds will be reinvested in August at a lower rate, but the reduction in earnings from the level the

bank is currently receiving will be at least (partially) offset by the profit made on the September futures contract. (Recall that T-bills are sold at a discount, and, as with other securities, if interest rates go down, the price of the newly issued T-bills goes up.) Even though the standardized contracts do not provide an exact match (either by amount or by date), they do provide an offsetting transaction that reduces risk. Because a perfect match need not be found, the high transactions costs of finding a unique trading partner, as in forward agreements, are greatly reduced.

Pit
The trading area on the floor of an organized exchange (such as the Chicago Board of Trade) where authorized brokers gather to buy and sell for their customers.

The futures price is set by bidding and offering in an auction-like setting on the floor of the exchange. Each financial instrument that is traded usually has its own **pit** (trading area on the floor) where authorized brokers gather to buy and sell for their customers. Bid and asked prices (to buy or sell) are called out until the brokers become aware of the prices in the market. The most favorable transactions (from the point of view of both the buyers and sellers) are consummated. Once an agreement is struck in the pit, the transaction becomes depersonalized, and the agents of the buyer and seller never meet again for that transaction. Instead, a **clearinghouse,** operated by the exchange, takes on the responsibility of enforcing the contract. Both the buyer and the seller rely on the clearinghouse to execute the transaction. Specifically, the seller looks to the clearinghouse to deliver, and the buyer looks to the clearinghouse to pay the amount due on the delivery date. In this way, the default risk associated with a forward transaction is greatly reduced because the clearinghouse of the exchange assumes the obligation.

Clearinghouse
The part of an organized exchange that takes on the responsibility of enforcing a contract after the agreement is struck.

The futures contract is a standardized agreement to make a trade at a later date. In exchange for the small brokerage fee, the clearinghouse of the organized exchange guarantees that the terms will be met. To facilitate this guarantee, the exchange requires buyers and sellers of futures to put up a **performance bond,** called a **margin requirement,** set by the exchange. Brokers are required to collect margin requirements from their customers before they make any futures purchases or sales. Note that the performance bond or margin is required of both the seller and the buyer and that the brokerage fee plus the margin requirements are relatively small compared to the dollar value of the futures agreement. An example of how financial futures can be used by a firm, LHT, Inc., to hedge interest rate risk is given in the accompanying "A Closer Look" feature on p. 572.

Performance Bond
A bond required by an organized exchange from both the buyer and the seller of a futures agreement to ensure that both parties abide by the agreement.

Margin Requirement
The amount that brokers must collect from their customers before they make any futures purchases or sales.

In summary, financial futures markets have experienced spectacular growth in the past 30 years, because the financial world has become a much more volatile place and financial futures can be used to reduce risks associated with this volatility. Because interest rate swings are larger, the prices of government securities (or the value of any fixed-rate instrument) oscillate more rapidly and over a broader range. Stock prices now fluctuate over a wider range, and flexible exchange rates have increased the movement of currency prices, while foreign trade in goods, services, and securities has escalated sharply. Futures markets may be used to hedge all of these risks. We now turn to how the futures price is determined.

Recap

Financial futures are standardized contracts in which two parties agree to trade financial instruments at a future date according to terms, including the price, that are determined today. Financial futures are different from forward agreements because the quantities and delivery dates are standardized and, thus, the brokerage fees are relatively small. Financial futures markets exist for government securities, stock market indexes, Eurodollars, and foreign currencies. Both the buyer and the seller have obligations and rights. Financial futures can be used to hedge the risk of future changes in prices or to speculate. Organized exchanges trade the standardized contracts.

LHT Inc. Enters the Futures Market

Let's consider an example in which financial futures are used to hedge. Assume that LHT Inc. issued bonds 10 years ago and that those bonds will mature in a year. When the bonds come due, LHT Inc. will not be in a position to pay off the debt. Instead, it will issue new bonds (borrow) to raise the funds to pay off the owners of the original bonds.[a] Let's further assume that LHT fears that interest rates could rise over the next year, causing the new bonds to be issued at a higher interest rate. If this scenario materializes, the firm will have to make higher interest payments on the new bonds, which will cut sharply into profits. But something as important as profits need not be left to the vicissitudes of unknown interest rates one year from now! LHT can protect itself against an undesirable increase in rates by selling a T-bill future today. The T-bill futures agreement will oblige LHT to deliver so many T-bills on a later date, say, in one year, at a price set today. If the interest rate does rise over the course of the year, as LHT expects, the spot price of the T-bills will fall. (Remember the inverse relationship between the price of securities and the interest rate that we discussed in Chapter 5.) LHT can buy the T-bills in the spot market at the lower price for delivery to the purchaser of the futures contract who pays the higher price agreed on earlier. If the interest rate does rise, the loss due to issuing new bonds at a higher interest rate is offset by the profit that LHT makes on the T-bill futures contract.

But what happens if LHT Inc. is wrong about the direction of the interest rate over the next year and the interest rate falls or, equivalently, the price of T-bills rises? LHT takes a loss on the T-bill future because it buys the T-bills in the spot market at the *higher* price to deliver to the buyer of the futures contract for the *lower* price previously agreed on. However, LHT is not really worse off. The loss in the futures market is offset by the savings on the new bonds the corporation issues at a lower rate because interest rates have fallen.

As you have seen, the securities usually are not actually delivered physically. Instead, the buyer or seller of the futures agreement merely pays any price difference between the spot price and the futures price. In this case, if the interest rate does go up, LHT receives a payment from the seller of the T-bill futures agreement that offsets the loss incurred by having to issue bonds at the higher interest rate. If the interest rate goes down, LHT makes a payment to the seller of the T-bill futures agreement but issues the new bonds at the lower interest rate.

LHT Inc. has successfully used the futures market to reduce the risk of losses if interest rates go up while sacrificing the possibility of gains if interest rates go down—a trade that the firm may be happy to make. Can you explain what happens if interest rates stay the same over the course of the next year? Think about it before checking the answer in endnote b.[b]

Endnotes

a. Borrowing to repay maturing debt is called *rolling over* and is actually quite common.

b. LHT Inc. buys T-bills in the spot market to deliver to the purchaser of the futures contract at the same price for which it sold the contract. Aside from a small brokerage fee to purchase the futures contract (that can be thought of as an insurance premium), LHT Inc. is no worse off.

DETERMINING THE FUTURES PRICE

Financial futures are traded each day on exchanges around the world. The exchange delivers or accepts for delivery the futures contract at the specified future time and place at a price agreed on today. The buyer or seller merely accepts the risk of a price change of the contract and agrees to pay off any financial losses or to receive any financial gains. There are several different futures prices, depending on the expiration date of the futures contract. In this section, we pose the question, How are those prices determined? We hope that buzzers and alarms are going off in your head and that your immediate response is "supply and demand." Of course, you are right! But, in this case, it may prove beneficial to look a little more closely at what determines the supply and demand for financial futures and, hence, their prices.

Perhaps the first and most important thing to point out is that the futures price and the spot price are highly correlated—that is, they move up and down together. This is not accidental but due to actions of individuals called **arbitrageurs** who seek a riskless profit.

Arbitrageurs
Traders who make riskless profits by buying in one market and reselling in another market.

Consider what happens if a futures contract for Treasury bonds to be delivered in three months is much higher than the present spot price. An arbitrageur could purchase the Treasury bonds in the spot market while selling a futures contract. She could hold the bonds purchased in the spot market for delivery at the later date to fulfill the futures contract. Granted, she would incur some **carrying costs** in holding the Treasury bonds (or the gold or whatever), but as long as the futures price is higher than the current spot price plus the carrying costs, she would make a riskless profit. (Carrying costs generally consist of the interest costs for the use of the funds to purchase the securities, less the interest earned on the securities while the arbitrageur is holding them, plus other transactions costs of the exchange.) On the other hand, if the futures price were below the spot price plus carrying costs, arbitrageurs (who owned some of the securities) would buy futures, driving the futures price up, and sell in the spot market, driving the spot price down. Can you explain how a riskless profit would be made?[8]

Carrying Costs
Interest costs for funds used to purchase the security underlying a futures contract plus any transactions costs.

When and if such an opportunity for riskless profit opens up, arbitrageurs move in, purchase in the spot market (driving up the price), and sell in the futures market (driving down the price), and vice versa. As the delivery date of the futures contract comes closer, the length of time in which funds are borrowed to establish the position is reduced. Therefore, as the delivery date nears, the carrying costs are reduced, and the futures price approaches the spot price. Arbitrage continues until the futures price is bid up (down) to the spot price plus carrying costs—a phenomenon called **convergence.** Thus, on the last day before the expiration date, the futures price is practically equal to the spot price—the carrying costs are negligible since only one day is left. Hence, because futures prices are highly correlated with spot prices and because convergence occurs, futures prices are ultimately determined by the spot prices of the underlying contract instruments. Now would be a good time to read "A Closer Look," which discusses stock index futures and the October 1987 crash of the stock market.

Convergence
The phenomenon in which the futures price is bid up or down to the spot price plus carrying costs; the futures price approaches the spot price as the expiration date draws nearer.

Recap

The futures price is determined by supply and demand. If the futures price is higher than the spot price plus the carrying costs, an arbitrageur will sell a futures agreement and, at the same time, purchase securities in the spot market. The increased supply of futures will push the price down until the difference between the spot price and the futures price is equal to the carrying costs. If the futures price is lower than the spot price plus carrying costs, arbitrageurs (who own some of the underlying instruments) will buy futures and

A Closer Look

Stock Index Futures and the '87 Crash

A stock market index such as the Dow Jones Industrial Average is an index that measures price changes of a market basket of stocks included in the index. Stock index futures are contracts that give the purchaser (seller) the right and obligation to purchase (sell) a multiple of the value of the index on some specified date in the future at a price determined today. Stock index futures are available for several indexes of stock market activity, and the futures contract calls for the delivery of the cash value of a multiple of a particular stock index.

Perhaps the two most prominent stock index futures are the futures contracts for the S&P 500 and the NYSE Composite Indexes. In both cases, the contract size is $500 times the index on the delivery date. The financial futures contracts are available for the quarterly dates (during March, June, September, and December) over the next two years. For example, if Jamal purchases a December contract for the S&P 500, this gives him the right and obligation to receive on the delivery date $500 times the value of the S&P 500 stock index on that date. The price for the future delivery is negotiated today. Let's say Jamal negotiates a price today of $275,000, which he will pay on the delivery date. Consider the two cases for the delivery date on which the S&P Index is (1) 525 or (2) 575. If it is 525, the seller pays $262,500 (500×$525) but receives $275,000 from Jamal. If it is 575, Jamal pays $275,000 but receives $287,500 (500×$575). In the first case, the seller makes a profit. In the second case, Jamal makes a profit. If $500 times the value of the index is greater than the futures price, the buyer of the futures makes a profit. If it is less, the seller makes a profit.

As with all futures, the spot and futures prices move up and down together. In the case of stock index futures, arbitrage prevents the futures price from deviating a tremendous amount from the spot price. For instance, if the futures price is far higher than the spot price, an arbitrageur could make a riskless profit by buying a market basket of stocks that made up the index while selling a futures contract. As long as the futures price exceeds the spot price plus the cost of carrying the inventory of stocks, the arbitrageur could make a riskless profit. By doing so, however, she would be increasing the demand for stocks in the spot market (pushing up the index) and increasing the supply of futures contracts (pushing down their price). As in other futures markets, arbitrage would keep the spot and futures price in close alignment with one another.

But wouldn't it be difficult to recognize every opportunity for arbitrage and go into the spot market to purchase the market basket of stocks that make up the stock index? After all, in the case of the S&P 500, one would have to purchase (or sell) 500 different stocks. Not even the largest of most small investors can do this. As you saw in Chapter 13, however, the advent of sophisticated computer technology has allowed brokerage houses and institutional investors (such as mutual funds and pension plans) to program automatic purchases and sales of stock index market baskets into a computer. Sales or purchases can be triggered automatically when the stock index futures price gets out of alignment with the spot price. This *pro-*

gram trading allows every opportunity for arbitrage to be exploited immediately. As advantageous as this may seem to the brokerage house that uses it, program trading can be controversial.

During the week of October 12–16, 1987, the Dow Jones Industrial Average fell 250 points, and on Monday, October 19, 1987, it plummeted 508 points, or more than 20 percent—the largest percentage drop in history and the largest point drop to that time. Could program trading have been the culprit in this major downturn?

Consider what would happen if a stock index futures suddenly fell steeply. Program trading would trigger spot market sales of the stocks that made up the index, as well as purchases of index futures. A major fall in the futures price could bring about large sales (and plummeting prices) in the spot market for stock. *Stop orders* (or orders to automatically sell if the stock price falls to a certain level) would be triggered, which would cause further plummeting of spot prices and could reverse the trend of purchases in the futures market. Indeed, the October 1987 crash was triggered by program trading and stop orders.

To prevent a reoccurrence of the 1987 crash, many exchanges have put in circuit breaker restrictions that, among other things, limit computerized program trading if the index falls more than a certain amount on any day. They have been activated many times.

Other analysts are less concerned about program trading than about the cause of the fall in futures prices to begin with. If futures prices fall because of the expectation that spot prices will be falling, the arbitrage causing the present spot price to fall may simply be rational price adjustment in a declining market. By restricting computerized trading, we may be treating only the symptoms of a problem without treating the cause. Maybe the market, like a virus, should be allowed to run its course, or maybe a little preventive medication will stop a mild virus from turning into a severe infection. Opinions about the extent of intervention needed continue to differ.

sell in the spot market. The futures price will go up, and the spot price will come down until the difference equals the carrying costs. As the delivery date nears, the spot and the futures prices converge.

OPTIONS

In the previous sections, we pointed out that business firms (financial and nonfinancial) or individuals can use the futures market to reduce the risk of price changes inherent in everyday business. Thus, if they need to buy or sell a financial instrument in the future, they can use the futures market to offset any possible loss due to an unanticipated price change between now and the day when they will be making the purchase or sale. An unattractive feature of the futures market, however, is that it also eliminates a possible gain from a price change.

For example, consider the case in which Michael needs to borrow $1 million in a month. He knows what the interest rate is today, but is concerned that it will be higher in a month. He can sell a T-bill future for $1 million that gives him the right

and obligation to sell the T-bills in 30 days at a price determined today. If the interest rate goes up, he borrows at a higher rate, but the price of the T-bill futures contract falls and he makes a profit. This profit offsets the higher borrowing costs (and accomplishes his goal of reducing the risk of losses if the interest rate goes up). If the interest rate goes down, Michael gains by borrowing at a lower rate. However, he loses money on the T-bill futures (because lower interest rates cause the T-bill futures price to rise and he is locked into selling at the lower price). Therefore, to reduce the risk of losses from the interest rate rising, he forgoes the chance of a gain if the interest rate falls.

Could there be another way to get risk protection from a loss without giving up the possibility of a gain? If you said, "Surely there must be because markets are so quick to respond to changing needs and conditions," you are correct (or, as we shall see, almost correct). We now turn our attention to options to demonstrate how our friend Michael can use them to reduce the risk of an interest rate increase over the next month without forgoing a gain if rates fall.

Options
Standardized contracts that give the buyer the right, but not the obligation, to buy or sell an instrument in the future at a price determined today.

Strike Price
The agreed-upon price in an options contract.

Options on Futures
Options that give the buyer the right, but not the obligation, to buy or sell a futures contract up to the expiration date on the option.

Options are similar to futures in that they are used to reduce the risk of future price changes or to speculate. Options give the buyer the right, but not the obligation, to buy or sell an instrument in the future for a price determined today. The agreed-upon price is called the **strike price.** This right continues until an expiration date specified in the contract. Options exist for many agricultural products, commodities, individual stocks (such as AT&T, IBM, and EDS), and many other financial instruments. Now would be a good time to read the accompanying "A Closer Look" on options.

In addition, options are available on the major types of futures contracts, including stock index futures, currency futures, and interest rate futures. These options, aptly called **options on futures,** give the buyer of the option the right, but not the obligation, to buy or sell a futures contract up to the expiration date of the option. As you have seen, at the delivery date of a futures contract, the futures price converges to the spot price of the underlying financial instrument. Hence, on the delivery date, the investor should be indifferent between hedging with a futures contract or hedging with the underlying debt instrument. Option contracts are often written on futures contracts rather than on the underlying debt instruments themselves because the futures contracts are often more liquid than the underlying financial instruments. This is because the secondary markets for most financial instruments are not as highly developed as the futures markets. Options are available for specific dates in the future, often for the two closest months and then for March, June, September, and December for the next nine months. As in the case of futures, the clearinghouse of the exchange enforces the contract and, for a fee, takes on the default risk.

Many of the similarities between futures and options stop here, however. There are two kinds of options, and we will briefly outline each of them, focusing mainly on financial options.

Put Options

Put Options
Options that give the buyer of the option the right, but not the obligation, to sell a standardized contract of a financial instrument at a strike price determined today.

Put options give the buyer of the option the right, but not the obligation, to sell a standardized contract of a financial instrument or a futures agreement at a strike price determined today. The seller has the obligation, but not the right, to buy the contract if the buyer exercises it before the expiration date.[10] Therefore, Michael, who has to borrow $1 million in the next month, can hedge the risk of a future interest rate increase by buying a put option on, say, a T-bill or Treasury bond contract. If the interest rate does go up, he exercises the option at a profit to offset the loss incurred by having to

A Closer Look

More About Options

Options are available for hundreds of individual domestic and foreign stocks, for many stock indexes (both broad based and sector indexes), for exchange-traded funds (ETFs), and for foreign currencies. Most options must be exercised in less than one year. However, there are long-term options (both equity and index) whose specified time to exercise the option is more than one year. The New York Stock Exchange ARCA Options trading system, the Chicago Board Options Exchange, and the Philadelphia Stock Exchange are among the largest options exchanges in the United States. The International Securities Exchange, which was the first electronic options exchange, was launched in May 2000, and today it rivals the options trading and products of the other exchanges. The Chicago Board Options Exchange also makes an options market for Treasury securities that can be used to hedge interest rate risk.

Barron's has a wealth of information about options, prices, and the exchanges they trade on available for free online at **www.barrons.com**.

borrow at the higher rate. Like futures, financial options are written only in standardized contract amounts for delivery on a few specific dates, and a perfect offsetting transaction is rarely found. Nevertheless, risk is still reduced. Unlike futures, put options allow the risk of an interest rate increase to be hedged without losing the possibility of a gain if the interest rate goes down. If rates do fall, Michael simply does not exercise the option. He has used put options to reduce the risk of an interest rate increase when he has to borrow in the future. Put options could also be used to reduce the risk of a price decrease by anyone who has to sell a financial instrument in the future.

Call Options

Call Options
Options that give the buyer of the option the right, but not the obligation, to buy a standardized contract of a financial instrument at a strike price determined today.

Call options give the buyer the right, but not the obligation, to buy a financial instrument at a strike price determined today anytime before the expiration date. Note that the buyer has the right, but not the obligation, to buy. The buyer exercises the option (buys the instrument or futures contract at the strike price) only if it is in his or her interest to do so—that is, only if the price of the financial instrument is higher than the strike price. If the price of the financial instrument or futures contract falls, the buyer is not obliged to exercise the option and will let it expire. The option allows the buyer to limit the losses from a price increase without limiting his or her ability to take advantage of a price decrease.

Recap Options give the buyer of the option the right, but not the obligation, to buy or sell an instrument in the future for a price determined today. Put options give the buyer the right, but not the obligation, to sell a standardized contract at a price determined today anytime

before the expiration date on the option. A call option gives the buyer the right, but not the obligation, to buy a financial instrument at a price determined today anytime before the expiration date on the option.

The Option Premium

You might ask, however, why any individual or firm would hedge risk with futures that limit both losses and gains when they could use options that limit only losses. If you said, "Because futures must be cheaper," you may have a future as an economist! Futures cost very little—basically, only a small brokerage fee, which is low because the contracts are standardized and the volume in the market is very large. Both parties to the agreement have rights and obligations. With options, however, one party has rights with no obligations, and the other party has obligations with no rights. From the buyer's position, put or call options give the right but not the obligation to sell or buy the contract at the agreed-upon price if the buyer exercises the option. In addition to paying the exchange a brokerage fee, the party with the rights but no obligations (the buyer) pays an **option premium** to the party with the obligations but no rights (the seller). Make sure you are clear that the buyer of a put option has the *right*, but not the *obligation*, to sell, while the buyer of a call option has the *right*, but not the *obligation*, to buy.

Option Premium
The premium paid by the buyer of an option to compensate the seller for accepting the risk of a loss with no possibility of a gain.

The premium is the reward to the seller of either a put or a call option for accepting the risk of a loss with no possibility of a gain. In the case of interest rate options, for the hedger to be better off, the loss from the interest rate increase that the hedger avoids must be larger than the put option premium. In addition to the option premium, the option still entails a small brokerage fee for arranging the trade.

So far, we have been discussing situations in which options are used to hedge. As you might have guessed, put and call options can also be used to speculate. Needless to say, speculation in this manner can be extremely costly because option premiums are often quite substantial (costing several thousand dollars). If the option is not exercised, the buyer of the call or put option loses the option premium. Hedgers can think of the option premium as an insurance premium, limiting the amount of losses they will incur if a financial instrument must be purchased or sold at a later date. For speculators, the option premium is the amount that they are willing to bet when they believe that the price will change significantly from the strike price, thereby creating potential profit. As with hedgers, for the speculator to benefit from purchasing the option, the price must increase (in the case of call options) or decrease (in the case of put options) enough to more than cover the option premium. The downside to options, of course, is the option premium, which can be quite substantial, as compared to the usually small brokerage fee for buying or selling a futures contract. Economists are famous for saying: "There is no such thing as a free lunch!" If options are used to exploit gains while limiting losses, this is certainly true.

In summary, someone who needs to buy a financial security or instrument in the future can hedge the risk of an inopportune price increase by paying an option premium to purchase a call option, which gives the buyer the right to purchase the instrument at a price agreed on today up to the expiration date of the option. On the other hand, someone who needs to sell a financial security or instrument in the future can hedge the risk of a price decrease by paying a premium to purchase a put option, which gives the buyer the right to sell the contract at a price agreed on today up to the expiration date. The sellers of the call or put options are not hedging but merely accepting risk for a price—in this case, the option premium. The buyer of a call or put option is hedging

risk without giving up any potential for gains, as in the case of futures. Like futures, options can also be used to speculate about future price changes.

DETERMINING THE OPTION PREMIUM

As in all unregulated markets, the price to buy either a call or a put option (the option premium) is determined by the forces of supply and demand. Unlike futures markets, in which both parties to the transaction can be hedgers, in the case of options only one party to the transaction can be a hedger. For call and put options, the buyer can be a hedger. Both of these parties could also be speculators, but our point is that the seller of a call or put option can never be hedging. The seller is merely accepting risk for a premium—the option premium.

For any given options contract, the option premium will generally be higher when

1. The price of the contract instrument is more volatile.
2. The expiration date of the option is further into the future.
3. The strike price relative to the spot price for put options is higher, or the strike price relative to the spot price for call options is lower.

Eurodollars and T-bills are available in $1 million contracts for delivery on the same dates. Volatility in the price of the contract instrument affects the option premium. If the price of Eurodollars fluctuates more than the price of T-bills (all other factors being equal), the option premium for the Eurodollar option will be higher than the option premium for the T-bill option. Because of the greater volatility, the probability that the seller of the Eurodollar call or put option will lose is higher, and therefore the premium must be higher to compensate.

Second, time influences the option premium because the further into the future the expiration date is, the more time there is for the price to fluctuate and, hence, the more risk that the option will be exercised. Also, the further we look into the future, the more uncertain things become. Therefore, the more time there is before the expiration date, the higher the option premium will be.

Third, the strike price also affects the premium. If the strike price for a call option is very low relative to the spot price, it is much more likely that the spot price will go above the strike price and that the option will be exercised. Hence, the lower the strike price for a call option, the higher the option premium will be. For a put option, the higher the strike price, the more likely it is that the spot price will be lower than the strike price and that the buyer will exercise the option. Therefore, the higher the strike price for a put option, the higher the option premium will be.

Finally, note that the option still entails a small brokerage fee (for arranging the option) in addition to the option premium.

Recap The option premium is paid by the party who has rights but no obligations. The seller of the option receives the premium to compensate for accepting the risk of a loss with no possibility of gain. For any given options contract, the option premium will generally be higher when the price of the contract instrument is more volatile, the expiration date of the option is further in the future, or the strike price relative to the spot price for put options is higher or the strike price relative to the spot price for call options is lower.

One final note: We have looked at financial options and have seen that they can be used by business firms for managing risk due to price changes. Like forward and futures

The Collapse of a California County and a British Bank

What do Barings Bank of London and Orange County, California, have in common? Not much to the casual observer, but events in late 1994 and early 1995 put the two close together in the history books forever. Within the span of a few months, both institutions were brought to their knees by massive losses sustained in the derivatives market.

We begin in affluent Orange County, located just south of Los Angeles. Robert Citron, a Democrat, had served as county treasurer for more than 24 years in this traditionally Republican county. As such, he managed the county's investment pool. Starting in the late 1980s, the pool began to grow rapidly from less than $1 billion to more than $8 billion as many other municipalities outside the county and other public entities opted to join the pool. They were attracted by its high return and the impressive earnings record that Citron had amassed. He was considered brilliant for consistently earning an above-average return, and others sought to share his good fortunes.

But all was not well, as wise investors should have suspected. After all, what is the probability of earning significantly above-average returns for several years in a row without taking more risks? Unfortunately, as Citron and the county found out all too late, the probability is not high. When all was said and done, Citron claimed to have had an "incomplete" understanding of the risks inherent in the financial instruments—or, as some would say, exotic derivatives—in which he was dealing. Having leveraged the $8 billion portfolio to $20 billion, he bet that interest rates would continue to fall in 1994. When the Fed began to raise rates in February, Citron failed to reverse his position. The pool owned securities whose value fell as rates rose. As rates continued upward, Citron faced reelection in June and denied to his constituency that the investment pool was in trouble. After his victory, he still tried to hold on, and by the time Wall Street refused to extend any more credit, the county was unable to come up with the funds needed to pay bondholders and was forced into bankruptcy. The portfolio was liquidated—that is, the securities whose value had fallen were sold—resulting in a $1.7 billion loss. Thus, the largest municipal bankruptcy in history had occurred in one of the country's wealthiest counties.[a]

Another unlikely candidate for bankruptcy was Barings, a prestigious British investment banking house that had been around for 233 years. Like Orange County, Barings was brought down by one individual. Nick Leeson was only 28 years old and, by most accounts, seemed to be on the fast track to success if not already there. He headed the futures trading department in Barings' Singapore branch. In 1994, his bonus topped $1 million—not bad for a kid who had grown up on the other side of the tracks. Who could guess that by late February 1995, he would be on the run and that Barings would be in bankruptcy? Here's how it happened.

Apparently, Leeson bought enough futures in a three-week period beginning in late January 1995 to have a $27 billion exposure. The transactions appeared normal because Barings had been taking large hedge positions for years in Nikkei Stock index futures—positions that were used to arbitrage even minute price differences between stocks traded in Singapore and Osaka, Japan. Around January 26, Leeson switched

from a hedged position to a speculative position. No one knows for sure what his thinking was, but it is suspected that he thought the Kobe earthquake would stimulate the Japanese economy and push up the Nikkei. As events unfolded, however, his strategy proved wrong; he sold call options to raise cash for margin calls. In this situation, he was betting the Nikkei would settle into a narrow range. By February 20, his losses had accumulated to $700 million, and Barings put up more cash to cover his deficit. Barings believed that the margin call was for a corporate customer whose funds would be deposited in a few days. When Leeson couldn't produce the funds, he fled, leaving behind a note that said, "I'm sorry." By this time, the loss amounted to $900 million—more than all of Barings' capital. The Bank of England put Barings into bankruptcy. Less than a month had elapsed since the start of the fiasco. Leeson was eventually apprehended, extradited to Singapore, and sentenced to prison for three and a half years.

The Orange County and Barings examples are not unique.[b] As *Business Week* put it, "In the easy-money boom, too many securities executives lost the ability or will to scrutinize high-energy traders or guard against unethical salespeople. Too many bankers and CFOs [chief financial officers] neglected to ask whether they understood the complexity—or the downside—of the highly leveraged derivatives they were using to hedge financial risks."[c] In such a world, the value of derivative contracts can fluctuate wildly from even small changes in stock, bond, or currency prices. What should be done to protect investors and institutions? For now that remains an unanswered question. But one thing is certain: both Barings' executives and the board of supervisors of Orange County regret not keeping a closer eye on the situation.

Endnotes

a. If the county could have held on until mid-1995, when rates turned back down, the losses would have been much smaller.
b. In April 1994, Procter & Gamble sustained a $102 million after-tax loss in an interest rate swap. Also in April of that same year, Kidder Peabody found that one of its traders had parlayed a $210 million loss. After the loss, Kidder Peabody was sold to Paine Webber.
c. "The Lesson from Barings' Straits," *Business Week* (March 13, 1995): 30–32.

contracts, options can be used to reduce the risks of price changes in future time periods. All of the markets that we have been discussing—financial forward, futures, and options—are examples of derivatives. Derivatives are financial contracts whose values are derived from the values of other underlying instruments, such as foreign exchange, bonds, equities, or an index. For example, the value of a financial futures contract in Treasury bonds derives its value from the underlying bonds. There are many kinds of derivatives, and those described in this chapter are relatively simple. Don't forget however, that derivatives can be used for speculating as well as hedging risk. In this case, they may increase risk, rather than reduce or manage it. "A Closer Look" gives an example of how derivatives brought down an otherwise healthy British investment bank and a wealthy southern California county.

This chapter contains one appendix that examines foreign exchange futures markets.

Summary of Major Points

1. In forward markets, the terms of a transaction (including the price) that will occur on a future date are arranged today. Forward transactions are used to reduce the risk that future price changes will eliminate profit. Forward agreements between individual parties are arranged by intermediaries. Forward agreements can have high transactions costs because they usually require the exact matching of two parties and because each party has a default risk in that the other party may not fulfill the agreement.
2. In financial markets, forward contracts in the most widely traded currencies have been established by large commercial banks. The bank is an actual participant in the agreement. In addition to buying and selling foreign currencies at spot prices, the banks also buy and sell the major currencies at forward rates. There does not have to be an exact matching of two parties. When there is not an exactly offsetting match, the bank has some exposure to exchange rate risk. Foreign currency forward agreements can be used to hedge exchange rate risk or to speculate about future currency values.
3. Financial futures are standardized contracts between two parties to buy or sell financial securities, such as government securities, stock indexes, Eurodollars, and numerous foreign currencies, on a future date at a price determined today. They are traded on major exchanges and are used to hedge interest rate risks, exchange rate risks, and the risk that stock prices will change. They can also be used to speculate about future price changes.
4. Because futures contracts are standardized, they have low transactions costs and high volume. They often do not provide an exact offsetting match with regard to the quality, the quantity, or the due date of the contract. The clearinghouse of the exchange enforces the contract and, for a fee, takes on the default risk. Both the buyer and the seller put up performance bonds. Arbitrageurs ensure that the futures price is equal to the spot price plus carrying costs. The futures price converges to the spot price on the delivery date.
5. Options are financial contracts that can also be used to hedge or speculate. They are available for many of the same financial instruments as futures. In addition, two kinds of options are offered for buying or selling futures contracts. A call option gives the buyer of the option the right, but not the obligation, to purchase the contract by the expiration date at a price determined today. A put option gives the buyer of the option the right, but not the obligation, to sell the contract by the expiration date at a price determined today. The buyer of a call or put option pays an option premium because she or he has rights but no obligations. The seller of the call or put option takes on the risk that the option will be exercised for a price, the option premium. Futures limit both gains and losses while options limit losses without limiting gains.
6. The option premium depends on the volatility of the financial instrument in the contract (such as T-bills), the difference between the strike price and the spot price, and the length of time until the expiration date on the option.
7. A foreign exchange futures market trades standardized contracts to buy or sell some amount of foreign exchange on a future date at a price determined today. These futures are widely used to hedge risks involving the delivery of one currency that must be converted to another currency at a later date. (See Appendix 23A.)

Key Terms

Arbitrageurs, p. **573**
Call Options, p. **577**
Carrying Costs, p. **573**
Clearinghouse, p. **571**
Convergence, p. **573**
Financial Forward Contract, p. **562**
Financial Futures, p. **567**
Financial Futures Markets, p. **567**
Foreign Exchange Futures Contract, p. **585**
Forward Rate, p. **563**
Futures Contracts, p. **567**
Hedge, p. **563**

Margin Requirement, p. **571**
Option Premium, p. **578**
Options, p. **576**
Options on Futures, p. **576**
Performance Bond, p. **571**
Pit, p. **571**
Put Options, p. **576**
Strike Price, p. **576**

Review Questions

1. Define *financial futures*, *forward agreements*, and *options*. What are the advantages and disadvantages of each?
2. How do spot markets differ from forward markets? How do spot markets differ from futures markets?
3. A government report forecasts both higher inflation and higher interest rates in the future. Yvette needs to borrow money in six months. What can she, as a future borrower, do now to protect herself from the risk of an increase in the interest rate? What if she is the lender?
4. Why do both the buyer and the seller of futures contracts have to put up performance bonds? When does the seller profit? When does the buyer profit? How is the clearinghouse protected from losses?
5. Explain why the futures price is very close to the spot price on the day before the delivery date of a futures contract.
6. How do arbitrageurs and speculators differ?
7. Explain how arbitrage causes the futures and spot prices to converge.
8. Explain the difference between call and put options. Does the buyer or the seller of an option pay the option premium? Why does the seller of an option take on the risk?
9. What are options on futures?
10. Explain how an investor could use a stock index future to hedge the risk of a fall in stock prices.
11. Assume that an intermediary uses futures only to hedge risk but never to speculate. Is it as vulnerable to losses as an intermediary that uses futures to speculate? Explain.
12. What factors determine the size of the option premium?

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

13. Angela buys a Treasury bond futures agreement for $94,000. On the delivery date, the spot price is $95,000. Does she win or lose? By how much? If Angela bought the futures contract to hedge, can she lose? Explain. (Hint: What if she is willing to give up the opportunity for gain to reduce the risk of loss?)
14. IBM sells a Treasury bond futures agreement for $94,000. On the delivery date, the spot price is $95,000. IBM sold the futures agreement to speculate. Does IBM win or lose? Explain.

✓15. A firm buys a December $100,000 Treasury bond call option with a strike price of 110. If the spot price in December is $108,000, is the option exercised?

✓16. A firm buys a December $100,000 Treasury bond put option with a strike price of 110. If the spot price in December is $108,000, is the option exercised?

✓17. An investment firm buys a December $100,000 Treasury bond put option with a strike price of 105. If the spot price in December is $108,000, is the option exercised?

✓18. An investment firm buys a December $100,000 Treasury bond call option with a strike price of 105. If the spot price in December is $108,000, is the option exercised?

✓19. If the settle price for a T-bill futures contract is 96.75, what is the percent discount?

✓20. A brokerage house purchases an S&P 500 futures agreement for $300,000. On the delivery date, the S&P 500 Index is 575. Does the brokerage house make a profit? What if the S&P 500 is 625?

21. If I buy a T-bill future for $950,000 and interest rates go up between now and the delivery

date, what will happen to the price of the T-bill future? Will I make money or lose money? Explain.

22. Assume that you will inherit a $1 million trust fund from your family when you turn 21 next year. Interest rates are high right now, and you fear they may be lower in a year. Explain in detail how you can use futures or options to alleviate your fears.

23. Ruben is exporting Colombian coffee to the United States. He will be paid $100,000 in six months, but he is concerned about how much of his domestic currency (Colombian pesos) he will receive for the $100,000. Explain in detail how he can reduce the risk that, in six months, the peso will depreciate in value against the dollar and he will receive fewer pesos than he anticipates. (See Appendix 23A.)

Suggested Readings

From the home page of the *Wall Street Journal* (**www.wsj.com**), a wealth of information about futures that can be accessed for free. *Barron's*, the weekly financial magazine, has an abundance of free information about both futures and options available at **www.barrons.com.**

The Chicago Board of Trade Web site, available at **http://www.cbot.com,** provides information about options trading.

Find information on the trading of futures and options at the Chicago Mercantile Exchange at **http://www.cme.com.**

Shalini Patel and Paula Tkac look at the futures market in their article "The Past, Present, and Future of Futures," *EconSouth*, Federal Reserve Bank of Atlanta, 9, no. 3 (Third Quarter, 2007).

A book that some consider the authority on futures and options is John Hull's *Options, Futures, and Other Derivatives*, 6th ed. (Upper Saddle River, NJ: Prentice Hall, 2006).

For a look at some of the material covered in this chapter, see Jeffery W. Gunther and Thomas Siems, "Debunking Derivatives Delirium," *Southwest Economy*, Federal Reserve Bank of Dallas, Issue 2 (March/April 2003). The article is available online at **http://www.dallasfed.org/research/swe/2003/swe0302b.pdf.**

"An Option for Anticipating Fed Action," by John B. Carlson, William R. Melick, and Erkin Y. Sahinoz, looks at how options on federal funds futures can be analyzed to gauge public expectations of future Fed actions. The article is available in *Economic Commentary*, Federal Reserve Bank of Cleveland (September 1, 2003), and online at **http://www.clevelandfed.org/Research/Commentary/2003/0901.pdf.**

For a comprehensive analysis of futures markets, see A.B. Malliaris, *Foundations of Futures Markets: Selected Essays of A.G. Malliaris* (Northampton, MA: Edward Elgar, 2000).

For a collection of 70 articles written on options over the past 25 years, see *Options Markets*, ed. George M. Constantinides and A.G. Malliaris (Northampton, MA: Edward Elgar, 2001).

For a discussion of the risks that derivatives pose for banks, see Chapter 7 of Franklin R. Edwards, *The New Finance: Regulation and Financial Stability* (Washington, DC: The AEI Press, 1996): 120–147.

Two comprehensive and somewhat technical articles are "Money Market Futures" and "Options on Money Market Futures," both found in *Instruments of the Money Market*, 7th ed., ed. Timothy Q. Cook and Robert K. LaRoche (Richmond, VA: Federal Reserve Bank of Richmond, 1993).

Appendix 23A
The Foreign Exchange Futures Market

In the body of this chapter, we discussed foreign exchange forward agreements that are offered by large banks to allow their customers to hedge exchange rate risk. In addition to these forward markets, large futures markets that trade foreign exchange futures contracts have also developed to hedge exchange rate risk. Both forward and futures

agreements in foreign currencies facilitate cross-border trading in goods, services, and financial claims. Both achieve similar results. This appendix looks at foreign exchange futures contracts.

Foreign Exchange Futures Contract
A standardized contract to deliver a certain amount of a foreign currency on a date in the future at a price determined today.

A **foreign exchange futures contract** is a standardized contract to deliver a certain amount of a foreign currency on a date in the future at a price determined today. The agreed-upon price is the futures price. Like spot markets, foreign exchange futures markets have experienced remarkable growth due to the tremendous increase in trade and foreign investment, as well as the volatility of exchange rates. Foreign exchange futures markets have been organized since the mid-1970s and allow importers, exporters, and investors in foreign securities to hedge. Like other futures markets, they also provide the opportunity for speculation.

The foreign exchange markets, including both spot and futures markets, actually form the largest market in the world in terms of the volume of transactions. Spot markets do not have a single location, such as the New York Stock Exchange, but are located at large banks in the world's financial centers—London, New York, Tokyo, and Frankfurt. Large banks in financial centers in other countries are usually linked to the major banks in one of the financial centers, which, in turn, are linked by telephone, telex, or the Internet. Standardized futures contracts are traded on the Chicago Mercantile Exchange and require a relatively large minimum purchase. In reality, one worldwide foreign exchange market (either spot or futures) is open somewhere in the world 24 hours each day. Because supplies and demands change from day to day, exchange rates (both spot and futures prices) fluctuate day-to-day, hour-to-hour, and even minute-to-minute! The relationship between the spot and futures exchange rate is the same as the relationship between any spot and futures price in that they are highly correlated and converge as the delivery date nears.

Foreign exchange futures markets, like all futures markets, offer the opportunity to hedge risk or to speculate. Importers and exporters often enter into agreements to deliver goods in the future for a price determined today. Because the price is agreed on today without knowing the future spot exchange rate, there is a risk that the exchange rate between the two currencies will change between now and the delivery date. Thus, there is a possibility that the anticipated profit could be eliminated or, worse yet, that a loss could occur. This risk is referred to as *exchange rate risk.*

To hedge, an importer can enter the foreign exchange futures market. An example will help to clarify. Assume that Jean is exporting computers to a firm (Choca Firm) in Switzerland that plans to resell them at a profit. Choca Firm previously specialized in Swiss chocolates but now is trying to diversify by importing computers. Jean agrees to deliver 500 computers in September, three months from now, at a price of $1,000 per computer, or $500,000. Choca Firm will have to come up with $500,000 in September to pay for the computers.[10] Checking the exchange rate today, Choca finds that the Swiss franc/dollar rate is 1.1 Swiss francs. If the exchange rate stays the same (highly unlikely), Choca Firm would have to pay 550,000 Swiss francs (500,000×1.1) in September for the $500,000. This is great because Choca is confident that it can resell the computers for 600,000 Swiss francs, making a nice profit. But what if the Swiss franc depreciates (or, in other words, if the dollar appreciates) between now and September? If the Swiss franc/dollar rate changes to 1.2 Swiss francs (a depreciation of the Swiss franc and appreciation of the dollar), Choca Firm will have to pay 600,000 Swiss francs (500,000 × 1.2) for the $500,000 and will lose all of its profit. Worse yet, if the dollar appreciates to 1.3 Swiss francs, the importer will have to come up with 545,000 Swiss francs (500,000 × 1.3),

incurring a sizable loss! Thanks to organized futures markets, Choca can hedge this risk by buying a standardized foreign exchange futures contract in dollars.

For example, today a futures contract for delivery of dollars in September is selling for 1.105 Swiss francs. If Choca Firm purchases this contract, it knows that it will pay 1.105 Swiss francs for the delivery of $1 in September, or 552,500 (500,000×1.105) Swiss francs for $500,000, regardless of what the spot exchange rate is in September. For Choca Firm or any importer interested in importing computers rather than speculating on future spot exchange rates, this offers a simple way to reduce exchange rate risk.

Another use of foreign exchange futures markets is to hedge risk when foreign securities are purchased. For example, foreign purchasers of U.S. government securities know they will be delivered so many dollars in, say, 90 days when the security matures. Can you explain how selling a futures contract hedges the exchange rate risk in this case?[11] No wonder the growth of these markets has paralleled the growth of trade in goods, services, and financial securities.

Endnotes

1. For example, small changes in interest rates can lead to large changes in the prices or value of long-term fixed-rate assets such as bonds or mortgages.
2. With the fixed exchange rate system of the Bretton Woods Accord, under normal circumstances, there was no exchange rate risk. When situations were not normal—when there was a currency crisis—there could be substantial exchange rate risk if a country was seriously considering changing the value of its currency.
3. The exchange rate can also be expressed as $1=.64 euro (1 euro/1.559 = $1.559/1.559 = $1 = .64 euro).
4. Note that in the case of foreign exchange forward markets, large banks are actually the partners to forward transactions—namely, the bank buys currency from one customer and resells all or part of it to another in two separate forward contracts between each customer and the bank. The point is that the transactions are not between the two customers.
5. The risk of default is greatly reduced when one of the partners to the forward transaction is a large bank, as in the case of the foreign exchange forward markets.
6. As you saw in Chapter 3, Eurodollars are dollar-dominated deposits held abroad.
7. If the price of a futures contract changes, the buyer or seller settles up financially for any changes in value, usually by executing an opposing transaction. For example, if Suzanne purchases a futures contract, rather than taking delivery on the delivery date, she can sell a futures contract involving the same asset for the same delivery date. The sale effectively cancels out the purchase. Or if she had sold a futures contract, she can purchase a futures contract with the same delivery date, effectively canceling out the sale. Most futures contracts are settled in this manner: purchases in the futures market are reversed by sales in the futures market; sales in the futures market are reversed by purchases in the futures market. This fact does not alter the analysis, however.
8. Likewise, forward prices cannot diverge from spot prices by more than the carrying costs.
9. In this chapter, we are limiting our discussion to American options, which can be exercised anytime before their expiration date. European options can be exercised only on the expiration date of the option.
10. In this example, we are assuming that the importer must exchange domestic currency for the foreign currency—that is, Choca Firm must pay for its imports with the currency of the exporting country. The situation could work in reverse. In that case, the exporter would be paid in the currency of the importing country and have to exchange it for the exporting country's currency. Either way, the risk is the same; the only difference is in who bears the risk.

11. For example, assume that a Japanese firm purchases a U.S. government T-bill for $9,900. The T-bill sells at a discount, and the Japanese firm knows it will receive $10,000 in three months. The yen/dollar exchange rate on the date of the purchase is 110. Thus, the Japanese firm pays 1,089,000 yen (110 yen×$9,900) for the T-bill. If the exchange rate is the same in three months, the T-bill will return 1,100,000 yen for a profit of 11,000 yen. It is highly unlikely; however, that the exchange rate will be the same, and if the yen depreciates, the Japanese firm could see its profit reduced or even incur a loss. To hedge this risk, the firm can sell a futures contract today that agrees to deliver $10,000 three months from now at a yen price agreed on today. In this way, the firm will know exactly how many yen it will receive for the $10,000.

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CHAPTER TWENTY-FOUR 24

Securitization, which has been at the centre of the current crisis . . . was encouraged by the authorities as a means of spreading risk. Everybody appeared to win. Banks earned fees for originating loans without the burden of holding them on their balance sheets. Investors got assets that yielded more than government bonds and represented claims on a diversified group of borrowers. No wonder securitization grew so fast.

—*The Economist*, October 16, 2008

Asset-Backed Securities, Interest Rate Agreements, and Currency Swaps

Learning Objectives

After reading this chapter, you should know:

How asset-backed securities work and why they were created

The most common types of asset-backed securities

The benefits and risks associated with the use of asset-backed securities

How interest rate swaps, caps, floors, and collars can be used to reduce interest rate risk and shift risk between firms

How and why currency swaps are used to manage exchange rate risk

How inappropriate use of securitization contributed to the current financial crisis

SOUTH DAKOTA, SCHOLARSHIPS, AND SECURITIZATION

Risk assessment and management techniques that reduce cash flow volatility not only increase earnings, but also allow credit to be allocated more broadly. If a nonfinancial corporation can hedge against adverse interest rate, price, and/or currency movements, less capital needs to be set aside for reserves. These financial resources can then be redirected to internal research and development and higher levels of capital investment rather than used as a reserve against volatility. This will likely increase the firm's productivity and profitability. At the same time, since fewer funds are needed for reserves, credit can be allowed to flow to a wider array of deserving borrowers. In this chapter we will investigate how securitization, interest rate agreements (interest rate swaps, caps, floors, and collars), and currency swaps can, in theory, be used to achieve these objectives—as well as how securitization and misuse of financial derivatives have come to assume a large part of the blame for the financial crisis, which continues into 2009. We begin with a case involving the state of South Dakota's proposed use of securitization.

The governor of South Dakota proposes a new Regents Scholarship that will pay high school students up to $9,500 over four years of college at a public school if they meet certain GPA and course selection criteria and promise to abstain from tobacco use. The scholarship is to be funded by future receipts from South Dakota's portion of the recent federal tobacco industry settlement. But the governor and the state legislators are nervous. What if the nationwide restrictions on tobacco advertising and decreased tobacco use cause tobacco firm earnings to decline? What if these companies go bankrupt? This exposure to default risk could undermine the stream of future earnings upon which the governor's proposed scholarship is funded. Is there a way that the state of South Dakota could decrease its exposure to default risk, move up receipt of its tobacco payments, and reduce the uncertainty of future funding for the proposed scholarship plan?

The answer to all of these questions is an enthusiastic "Yes—for a price!" In 2001 South Dakota's governor signed legislation that allowed the state to make more certain its receipts from the federal tobacco settlement. Securitization refers to this process whereby relatively illiquid financial assets—here, future tobacco industry receipts—are packaged together and sold off to individual investors as securities. In short, rather than take the $25 million or so in annual tobacco payments over the next 30 years, the state of South Dakota would sell the rights to these future payments for an estimated $240 million today. This amount could be reinvested with the annual interest earnings used to partially fund the governor's scholarship plan. The $240 million would be paid by those purchasing the securities, and the securities themselves would be backed by the promise of future tobacco payments. As annual payments from the tobacco industry are received by the state, they would be passed through to the holders of the securities. In essence, securitization turns relatively illiquid instruments (like a promise of future tobacco payments) into liquid investments called **asset-backed securities (ABSs).** The tobacco companies' promise to pay (a financial asset) serves as collateral or "backing" for the state's issuance of securities.

Asset-Backed Securities
Securities that result from the process of securitization.

Note that the risk that tobacco companies will fail to make future payments is shifted from the state to investors who purchase these securities. Such shifting of risk can be beneficial, provided both parties recognize this shift. One problem that has become clear in recent years is that many of those to whom the risk has been transferred did not fully understand the nature of the risk they were assuming.

The state could realize a number of benefits from its participation in this sort of arrangement. It would receive its money up front and generate interest earnings. Securitization would also eliminate any exposure to default risk from the earnings shortfall

or failure of a tobacco company. However, there is a downside. The process is very expensive. Securitization would cost several million dollars to arrange. In addition, if the tobacco companies do not fail, the state would be forgoing tens and perhaps hundreds of millions of dollars in potential revenue over the next two decades. Thus, there are both advantages and disadvantages to the governor's decision to use his new authority to securitize.[1]

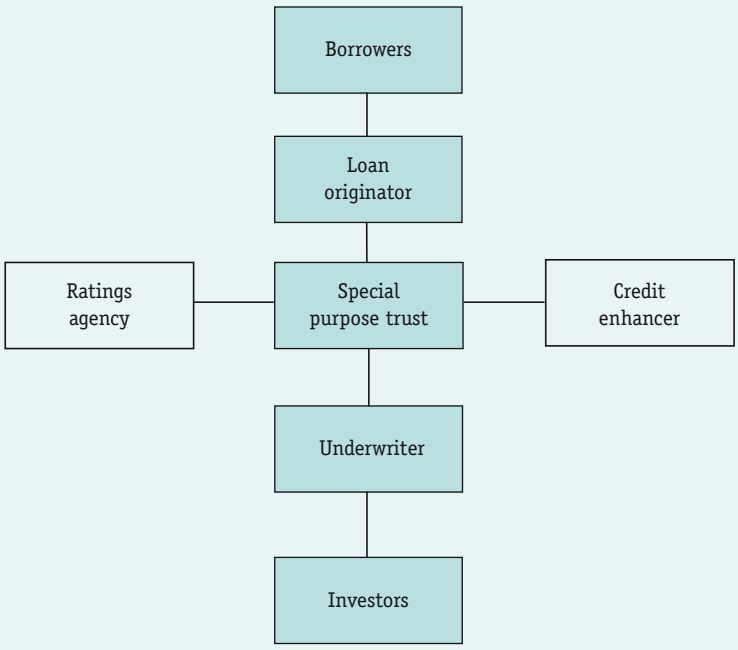
To fully appreciate the costs and benefits to the state of South Dakota as well as the investors, we first need to understand how the securitization process works. The first section of this chapter describes the process, discusses the origins of securitization, explores its benefits and costs, and describes trends among the most common types of asset-backed securities. The second section of the chapter describes instruments for managing interest rate risk and examines how various interest rate agreements (swaps, caps, floors, and collars) can be used to hedge against or speculate on interest rate changes. We then examine how currency swaps can be used to manage foreign exchange rate risk.

The management of financial risk has grown increasingly sophisticated. To be a successful financial manager—and in the case of South Dakota, an effective government official—requires a basic familiarity with these new types of financial instruments.

THE ANATOMY OF A SECURITIZATION

Exhibit 24–1 provides a diagram of a typical securitization structure. There are seven main sets of players: borrowers, loan originator, special-purpose trust, rating agency, credit enhancer, underwriter, and investors. To understand each of these players and their roles, let's talk through the anatomy of a hypothetical securitization. As is the case with human anatomy, we need to understand not only the individual parts, but also how the parts work together to create an organized system.

24-1
The Anatomy of an Asset-Backed Security Offering



Source: Adapted from Leon T. Kendall and Michael Fishman *A Primer on Securitization* (Cambridge, MA: The MIT Press, 1996), p. 3.

Step 1: Our borrowers need to take out loans. Let's assume that our borrowers use credit cards issued by First South-Western, a credit card bank and the loan originator of our example. When its customers use their credit cards to buy goods and services (or to take cash advances), they are creating credit card receivables for First South-Western. Our bank has been careful to screen credit card applicants according to predetermined criteria to ensure that these credit card balances will conform to the requirements of the resale market.

Special-Purpose Trust
A corporate agent that buys financial obligations from a loan originator and works with a security underwriter, credit enhancer, and rating agency to issue asset-backed securities; sometimes responsible for loan-servicing responsibilities.

Step 2: First South-Western can pool or group these credit card receivables together into $1 million bundles to be sold to a **special-purpose trust.** We call ours ITP Credit Card Receivables Trust. A trust is often the subsidiary of the loan originator or an investment underwriter. In either case, the special-purpose trust buys the rights to the future credit card payments and, with the help of the underwriter, issues the asset-backed securities. The special-purpose trust is also often responsible for monitoring the value of the collateral and managing the cash flows of the receivables pool. In some cases, a separate loan servicer is employed to manage the collections process.

The trust structure is employed for two main reasons. First, it allows the trust and the loan originator to be exempt from taxes. The trust simply acts as a conduit through which future payments are passed from credit card borrowers to the owners of the asset-backed securities. Thus, no taxable gain is created. The loan originator is allowed to account for the transaction as the discounted sale of receivables. This ensures that the loan originator shows no taxable profit on the transaction. Second, by buying the receivables outright, the transaction becomes bankruptcy remote. If First South-Western Bank (the loan originator) went bankrupt, the asset-backed security offering would be unaffected. Once ITP Credit Card Receivables Trust (the special-purpose trust) owns the receivables, the creditworthiness of the loan originator is immaterial.[2] Note, however, the viability of the trust depends on revenue from the credit card borrowers. Thus, it becomes possible for the originator to remain solvent while the special-purpose trust is unable to make promised payments to the holders of the asset-backed securities.

Step 3: As Exhibit 24–1 illustrates, ITP Credit Card Receivables Trust works with one of the largest credit-rating agencies, such as Moody's Investors Service or Standard & Poor's Corporation. Until recently, financial regulators and, perhaps more importantly, financial markets and investors, accepted the assessment of national credit-rating agencies as equal to **due diligence**—research performed to ensure that offerings financial statements are accurate—required in other loan and security offerings. Over-reliance on such ratings appears to have been a contributing factor to the financial crisis. An AAA rating used to be an accepted measure of quality and a virtual guarantee against default, but this is no longer the case.

Due Diligence
The investigative process used by a lender, investor, or investment banker to ensure that a borrower's or security issuer's financial statements are accurate.

Credit Enhancer
An insurance company or a bank that guarantees a security issue or offers a letter of credit in its support for a fee.

Step 4: To obtain the highest possible rating and lowest possible interest rate, ITP Credit Card Receivables Trust and the underwriter will work with a **credit enhancer** or find alternative means to enhance the perceived quality of the issue. A credit enhancer might be an insurance company or a bank that, for a fee, guarantees an issuance or offers a letter of credit in support of the offering. The creditworthiness of the asset bundle can also be enhanced by over-collateralizing the offering or establishing an outside reserve account to meet any future underpayments on the part of the borrowers. For example, if the principal amount of the issue is for $50 million, the pool of assets "backing" it may be $52 million. In this example, if $2 million worth of loans go into default, the investors are protected by the extra collateral. Similarly, the issuer may simply set aside an additional cash reserve that can be drawn on if the obligations backing the security issue fail to perform as expected.

Just as ordinary insurance is only as good as the company that provides it, enhancement of the credit rating of an asset-backed security is only as good as the credit of the firm providing it. As credit ratings of firms that stood behind the securities falls, the risk to investors in the asset-backed securities increases. As of 2009, this increase in counter-party risk had adversely impacted the attractiveness of asset-backed securities and thus contributed to the decline in their use.

Superior/Subordinated Debt Structure
A framework that allows securities to be sold in at least two different classes or tranches.

Tranche
A particular class or part of a securitization issue; some parts may be backed only by principal payments, others only by interest payments.

Another way to enhance the pool's credit is to use a **superior/subordinated debt structure.** In this type of structured issue, the securities are sold in at least two different classes, or **tranches.** A tranche is one part of a total asset-backed security offering. It might be backed by a portion of the principal or by the interest payments, or some combination of both. Each tranche is often given a different credit rating, coupon rate, and repayment period. The first class (the superior tranche) consists of highly rated and lower-yielding securities. These investors are paid before the subordinated (lower-rated and higher-yielding) security holders are paid. This allows the superior parts of the offering to be rated as investment grade while the subordinated class of securities is not.

This has been the key to the success of securitization. By selling the pool of payments in parts (with various credit enhancements and ratings), investors have been willing to pay more for the security offering than they would have if it were sold as a whole without credit enhancements or distinction between the tranches of different risk. For most offerings (at least until 2008), the premium for quality more than made up for the discount on the subordinated (highest-risk) portions of the offering.

In many cases the issuer of the securities (perhaps an investment bank) kept ownership of the riskiest tranches and earned the higher return on them. It was thought that these issuers were better able to absorb the risk. This practice worked well so long as the underlying assets maintained their value, but in recent years some asset prices have fallen so far as to impact the high-quality, as well as subordinated tranches.

Step 5: The underwriter works out the details with ITP Credit Card Receivables Trust, the credit enhancer, and the rating agency. Most importantly, the underwriter makes the market for the securities by arranging the sale of the securities and standing ready to buy those securities that fail to be sold in the market. The investors (either individual investors or institutional investors such as pension funds or insurance companies) themselves receive payments made by credit card customers that are passed through the loan originator and special trust. These payments ultimately end up as the interest and/or principal payments to the security holder.

Note how the use of a simple credit card can be the impetus for creating such sophisticated and mutually interdependent financial relationships. We turn now to a discussion of why borrowers, issuers, and investors engage in securitization. As with most financial and economic practices, it arises when the benefits appear to outweigh costs, so there are net gains to be divided between the participants.

SECURITIZATION BENEFITS TO BORROWERS, ISSUERS, AND INVESTORS

Borrowers, issuers, and financial investors can all benefit from the asset-backed securitization process. As we saw earlier in Chapter 14 concerning mortgages, the primary benefits to borrowers are twofold. First, securitization increases the funds available for home equity, auto finance, credit cards, commercial lending, student loans, and manufactured housing. Second, the costs of borrowing are lower than they would be through traditional intermediated (indirect) finance.

However, there are at least two possible disadvantages to borrowers. If a potential borrower fails to meet the established criteria for a loan intended for securitization, it is possible that the lender will reject the application or charge the applicant a substantially higher loan fee or interest rate. A second possible disadvantage is that the profitability of asset-backed securities might make some lenders excessively aggressive in pursuing loan business. This may have the effect of encouraging credit card companies to extend credit to borrowers with questionable credit quality and uncertain ability to repay the loan. This second problem was seen in the lax lending standards for mortgage loans, which were the impetus for the subprime mortgage meltdown of 2007.

The primary benefit accruing to issuers of asset-backed securities has already been noted. By carefully employing various credit enhancements and tranche structures, a lender can lower its cost of funds and thereby enhance its profitability. By issuing securities, banks can broaden their base of funding sources. Investors willing to buy ABS issues are unlikely to have made deposits at the bank, but through ABSs they become a source of funds for the issuer. The kinds of earnings generated are also altered, as earnings are shifted from interest earnings generated over time to more immediate loan origination and servicing fees.

In addition to enhancing earnings, securitization also enhances a lender's ability to reduce exposure to liquidity, credit, and interest rate risk. For instance, imagine a lender having a short-term cash flow, credit, or interest rate risk problem. Because of the increased use of securitization, our lender's holdings of **home equity loans,** credit card receivables, auto loans, and other types of credit are now increasingly marketable to investment banking firms wishing to underwrite asset-backed securities issues. The ability to sell portions of its loan portfolio (or issue its own ABSs) allows it to avoid the liquidity, credit, and interest rate risk associated with lending long and financing with short-term deposits. Furthermore, from a bank's perspective, by enabling it to sell assets, capital requirements are easier to meet and/or avoid. Securitization allows earnings to be generated without increasing the assets or liabilities held on the balance sheet.

Home Equity Loan
A type of mortgage that allows a borrower to use the equity in his or her home as backing for a loan or revolving line of credit.

This increased leverage enables greater returns on equity during good times, but also increases the risk of insolvency during bad times. In addition to increasing risk, securitization also makes the level of risk faced by financial firms more difficult to evaluate. This increase in the unmeasured uncertainty of asset values has been a central feature of the current financial crisis.

In normal times investors can benefit from the securitization of financial assets—they are given the possibility of purchasing relatively high-yielding, highly rated securities or to purchase even higher-yielding, higher-risk securities to meet their various investment needs. Tranches can be customized to meet almost any investor's need with respect to rating, yield, average term-to-maturity, and other aspects. Issues can be backed by highly diversified pools of loans.

But even in normal times asset-backed securities involve risk and investment losses are possible. One of the more problematic facets of ABSs is their ratings, which focus on assessing the default risk of the underlying assets given various economic scenarios. These scenarios are based on assumptions about future economic activity, likely default rates, and possible prepayment rates. As has recently become clear, problems result if the assumptions depart significantly from reality. Until 2008 investment grade securities were expected to weather a downturn similar to that of the Great Depression without significant risk of default; however, the unusually large fall in home prices and concomitant increase in home loan defaults in recent years have ratcheted up the risk of securities formerly ranked as investment grade.

Another less dramatic risk concerns prepayment of loans by borrowers. By convention, ratings have not attempted to assess the likelihood of borrower prepayment.

If interest rates fall, it is possible that borrowers will refinance their loans and prepayments will significantly reduce expected yields. Similarly, higher interest rates may increase default rates on variable-rate loans and also leave investors with unexpected reductions in yields or outright losses.

It is unclear if the current financial crisis will reverse the trend toward greater securitization or merely present a temporary setback. One potential alteration of the "originate, securitize, and sell" model of lending might be for regulations or market practices to require participation by the lenders. Some means for reducing the problem of lax lending standards while preserving securitization seems likely. Some means of reducing the risk to investors in asset-backed securities seems a necessary condition for future growth in securitization.

Recap

A typical securitization involves seven types of agents: borrowers, a loan originator, a special-purpose trust, a rating agency, a credit enhancer, an underwriter, and financial investors. Through the pooling of financial obligations, prudent credit enhancement, favorable credit ratings, and appropriate structuring, a securitization has the potential to significantly reduce transactions costs associated with moving funds from lenders to borrowers. Under favorable conditions, the result can be that borrowers pay lower borrowing costs, issuers earn higher profits, and investors receive higher yields. The real estate bubble from 2002 to 2007, however, showed that securitization can lead to inappropriate extension of credit to overleveraged borrowers, an increase in defaults, and a dramatic decline in the value of some asset-backed securities. The "originate, securitize, and sell" model of lending will have to overcome a number of hurdles if it is to resume its growth in the future.

THE ORIGINS OF SECURITIZATION

Now that you understand how securitization works and its benefits, you can better appreciate how pressures in the mortgage market of the 1970s and 1980s encouraged the rise of securitization. Home prices were increasing steadily and expectations of future increases bolstered demand for residential housing and mortgages. At the same time, savings and loan associations—the primary originators of home mortgages—watched as interest rates rose over and stayed above Regulation Q interest rate ceilings. Depositors withdrew their funds and moved them into money market securities or money market mutual funds that paid higher rates of interest. This, in turn, caused the supply of credit available for mortgages to shrink dramatically. The increased demand and decreased supply of loanable funds created a shortfall of funds for mortgage finance. Wall Street, specifically Salomon Brothers—an investment bank—tried to come up with an alternative funding source.

However, before mortgages or any other financial assets could be securitized, three essential legal, institutional, and technological changes had to be made. First, tax laws had to be changed so that payments could be allowed to pass tax-free from those making loan payments to those owning the asset-backed securities. Second, government guarantees and new government-sponsored enterprises (GSEs) facilitated the development of a secondary market. The Government National Mortgage Association (Ginnie Mae) began guaranteeing the timely principal and interest payments on mortgage-backed securities. The Federal National Mortgage Association (Fannie Mae) and Federal Home Loan Mortgage Corporation (Freddie Mac) created standardized underwriting criteria and an active secondary market for mortgage-backed securities beginning in the early 1970s. In fact, Freddie Mac and Salomon Brothers worked together to carry out the first mortgage-backed securitization issue. Third, computer technology improved enough to

track the cash flows of mortgage bundles with differing interest rates, terms to maturity, and face values. Without these legal, institutional, and technological changes, the new securities would have been impossible to create. By 1984, private groups, without the assistance of the GSEs, were issuing their own "private label" mortgage-backed securities that were traded in secondary markets. As a result, securitization continued to expand in the mortgage market not only in volume, but also in kind. Securitizations became common for a variety of fixed- and variable-rate mortgages and commercial real estate loans. In addition, securitization rapidly spread to other types of assets.

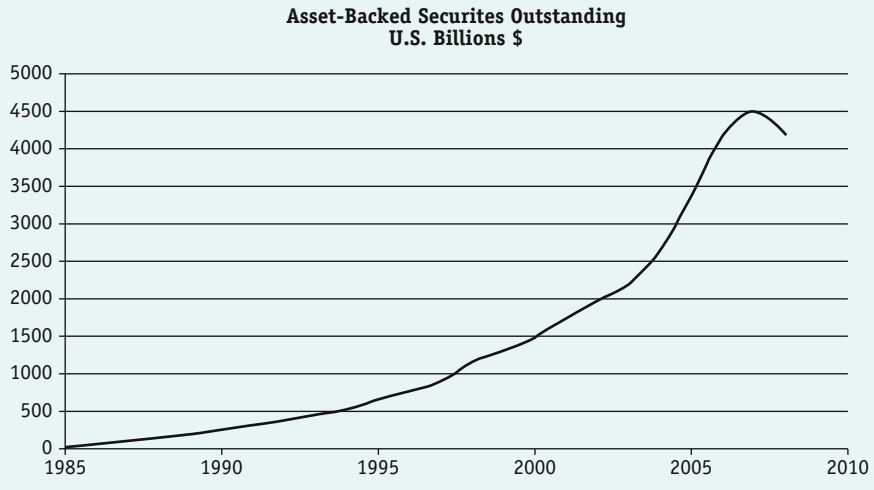
TRENDS IN COMMON TYPES OF ASSET-BACKED SECURITIES

Securitizations have been and are completed for a wide variety of different kinds of financial assets besides first mortgages. The term "specialty finance asset-backed securities" is used to differentiate these types of issues from those of mortgage-lending securitization. The most important of these includes home equity loans, automobile and truck loans and leases (including RVs and motorcycles), credit card balances, commercial loans,[3] student loans, and manufactured housing loans. "A Closer Look" describes the first securitization of small business loans.

Despite the "asset-backed" label, physical (hard) assets do not serve as collateral for all ABS issues. Credit card issues, for instance, are backed only by credit card receivables, a form of consumer loan.

As securitization grew in popularity and spread from mortgages to the many other types of activities, the outstanding value of asset-backed securities increased tremendously. Exhibit 24–2 illustrates the growth in the total amounts of asset-backed securities outstanding.[4] Prior to 1982, the Federal Reserve reported no securitizations. By 1987, asset-backed securities outstanding passed the $100 billion mark. By 1998, the amount outstanding increased tenfold and surpassed the $1 trillion mark. By the end of the third quarter, 2007, the nominal amount of asset-backed securities reached a peak of $4,532 billion. By the end of 2007 this trend reversed and by the end of the third quarter of 2008 the total value of asset-backed securities had fallen to $4,204 billion.

24-2
Total Asset-Backed Securities Outstanding (includes mortgages) through third quarter 2008



Source: Federal Reserve Flow of Funds, Table L.126, various years.

A Closer Look

Securitization of Small Business Loans

In the early 1990s, small businesses were particularly impacted by a credit crunch due to new capital adequacy requirements imposed on depository institutions by the Financial Institutions Reform and Recovery Act (FIRREA) of 1989. The situation was critical because small businesses did not have the same access to the commercial paper market as did medium-sized and large firms. Securitization of the small business loan market had not previously seemed feasible because small business loans are particularly diverse and are often funded on a subjective basis, i.e., small business loans are by nature heterogeneous. This characteristic would seem to render them a poor candidate for securitization, which develops most easily in markets for fairly homogeneous financial assets. For example, to be securitized and sold in a secondary market, mortgages are made to specific criteria regarding the income of the borrower and the loan-to-property value ratio. Under these circumstances, pools of mortgages are a fairly homogeneous lot. Auto loans, likewise, are made to certain income criteria with the vehicles serving as collateral. In the case of small business loans that are packaged and sold as securities, the backing includes accounts receivable, inventories, and equipment.

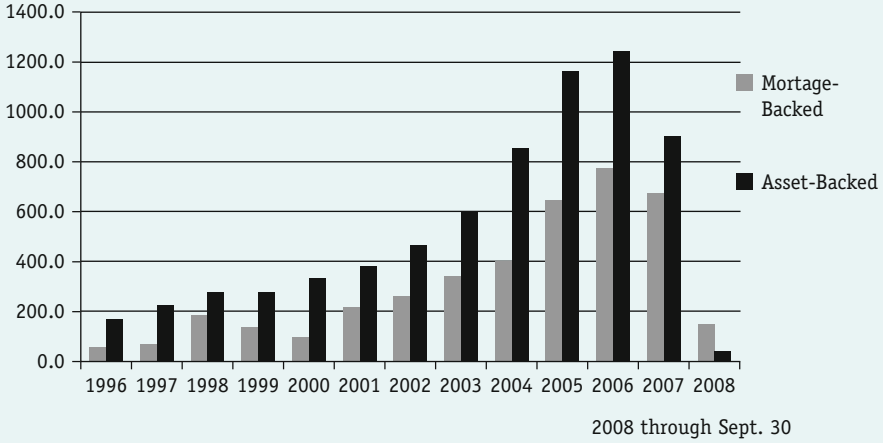
In early 1993, Fremont Financial Corporation of Santa Monica, California, sold $200 million of variable rate certificates backed by a pool of loans to small and medium-sized businesses. Merrill Lynch underwrote the offering, which quickly sold out, with the securities being bought by insurance companies, pension funds, and other large investors. The novelty of this offering was that unlike Small Business Association loans, which are guaranteed by the federal government, the Fremont offering had no government guarantee.

In theory, securitization of small business loans can spread risks among many investors. Fast-growing companies can be funded and income can be generated for the innovators. As the former Fed chair Alan Greenspan put it, a secondary market for business loans "would be a major contribution to the financial vitality of this country."

This reversal in the growth of asset-backed securities primarily reflects a reduction in overall credit in the United States, but it may also signal a resurgence of the traditional model of lending where intermediaries hold the loans they make as assets on their balance sheets.

The recent decline in securitization has not been uniform. Exhibit 24–3 shows new issuance of mortgage and asset-backed securities through the third quarter of 2008. Although the new issuance of both declined after 2006, the drop in asset-backed securities has been much more dramatic. Mortgage-backed securities may be more resilient due to the participation of government-sponsored entities such as Fannie Mae and Freddie Mac, which we examined in Chapter 14. It would be ironic if securitization problems resulting from subprime lending in real estate markets had a larger impact on nonmortgage asset-backed securities than mortgage-backed securities.

24-3
New Issuance of Asset- and Mortgage-Backed Securities



Source: The Securities Industry & Financial Markets Association (SIFMA).

In his book *The Age of Turbulence: Adventures in a New World* (2007), Alan Greenspan celebrated securitization when he wrote: "Being able to profit from the loan transaction but transfer credit risk is a boon to banks and other financial intermediaries which, in order to make an adequate rate of return on equity, have to heavily leverage their balance sheets by accepting deposit obligations and/or incurring debt. A market vehicle for transferring risk away from these highly leveraged loan originators can be critical for economic stability, especially in a global environment." Less than a year later, this ability of banks to use securitization to shift risk and increase leverage appeared to be a prime suspect in creation of the financial crisis, for which Mr. Greenspan shoulders at least some of the blame.

Recap

The high and volatile interest rates of the 1970s and 1980s encouraged large banks to pursue securitization as a means of increasing funding for traditional home mortgages. Changes in tax laws, the creation of government-sponsored enterprises (GSEs), and technological innovation facilitated this process. Securitization spread to many other types of asset-backed issues including home equity loans, auto finance, credit cards, commercial loans, student loans, and manufactured housing. Although it held out the promise of efficiency gains to be shared by all market participants, securitization is currently viewed by many as having contributed to the current financial crisis.

INTEREST RATE SWAPS

Interest Rate Swaps
Financial instruments that allow financial institutions to trade their interest payment streams to better match payment inflows and outflows.

Some interest rate agreements are used to hedge interest rate risk: interest rate swaps, interest rate caps, floors, and collars. **Interest rate swaps** involve two parties who trade interest payment streams to guarantee that their respective payment inflows will more closely match their outflows. Swaps can be used by some businesses (primarily intermediaries) to manage interest rate risk over long periods of time. Originating around 1982, they are currently used by commercial banks, saving and loans, other intermediaries, govern-

ment agencies, and securities dealers to reduce interest rate risk. Up until mid-2008 the use of swaps continued to grow, particularly at large banks. Swaps have the potential to make markets more efficient and reduce risks, but they are often complex. Because of their complexity, we limit our discussion to a simple case involving two commercial banks: Bank A and Bank B, as illustrated in Exhibit 24–4.

Bank A has long-term, fixed-rate loans, such as mortgages, that it funds with floating or variable-rate money market accounts. The interest payments on money market accounts fluctuate with market interest rates, but the interest payments earned on the loans do not. The other bank—Bank B—has made floating or variable-rate loans. The interest payments on these loans go up and down with an index of market interest rates,

24-4
A Simple Interest Rate Swap

THIS YEAR

Bank A	Bank B
Two-year loans earn 9% fixed	Two-year loans earn 8% variable
Deposits cost 5% variable	Deposits cost 6% fixed
Spread: 9% – 5% = 4%	Spread: 8% – 6% = 2%

NEXT YEAR RATES GO UP—NO SWAP

Bank A	Bank B
Loans earn 9% fixed	Loans earn 12% variable
Deposits cost 9% variable	Deposits cost 6% fixed
Spread: 9% – 9% = 0%	Spread: 12% – 6% = 6%
Lose	***Win***

NEXT YEAR RATES GO DOWN—NO SWAP

Bank A	Bank B
Loans earn 9% fixed	Loans earn 5% variable
Deposits cost 2% variable	Deposits cost 6% fixed
Spread: 9% – 2% = 7%	Spread: 5% – 6% = –1%
Win	***Lose***

NEXT YEAR RATES GO UP—THEY SWAP

Bank A	Bank B
Loans earn 9% fixed	Loans earn 12% variable
Deposits cost 6% fixed	Deposits cost 9% variable
Spread: 9% – 6% = 3%	Spread: 12% – 9% = 3%
Win	***Win***

NEXT YEAR RATES GO DOWN—THEY SWAP

Bank A	Bank B
Loans earn 9% fixed	Loans earn 5% variable
Deposits cost 6% fixed	Deposits cost 2% variable
Spread: 9% – 6% = 3%	Spread: 5% – 2% = 3%
Win	***Win***

The swap allows both banks to "win" regardless of the change in interest rates.

such as rates on government bonds. The bank funds these loans with long-term, fixed-rate deposits. The interest payments on these deposits do not change.

Both banks make a profit on the spread, or the difference between what the banks earn on their loans and what they pay depositors for the use of their deposits. But there is a problem: As the loans and deposits are now configured, both banks have some interest rate risk. In other words, both banks are in a position in which a change in interest rates can cause them to experience either no gain or a loss. If interest rates go up, Bank A (with fixed-rate loans and variable-rate deposits) ends up earning as much on its loans as it pays for its deposits. If interest rates go down, Bank B (with variable-rate loans and fixed-rate deposits) ends up paying more for the use of its deposits than it earns on its loans.

All is not lost, however. These two intermediaries can interact through an interest rate swap arranged by another bank. Bank A and Bank B can trade the interest payments on their deposits (liabilities), but not the principal payments. After the swap, Bank A will be funding fixed-rate assets with fixed-rate liability interest payments, and Bank B will be funding variable-rate assets with variable-rate instruments. Both can hedge risk by engaging in the swap. The interest payments received by Bank A are fixed because it has fixed-rate loans. After the swap, the interest payments it makes to fund the loans will also be fixed. A rise in interest rates will no longer put Bank A in a losing position. Bank B's earnings on its loans will continue to move up and down with market interest rates, but the interest payments it makes to fund the loans will also be flexible. A fall in interest rates will no longer eliminate Bank A's positive interest rate spread.

We have described a simple swap, but as noted previously, these instruments can be—and usually are—complex. A swap is often arranged for up to 15 years and has the advantage over forwards, futures, and option agreements of allowing the participants to hedge for longer periods of time.

When risks increase, as they do when markets become more volatile, market participants develop new ways to "handle" or manage the risk. Thus, we have witnessed the phenomenal growth of swaps. Financial and nonfinancial corporations must now be aware of and take every opportunity to reduce risks. If they fail to do so, they may find that they are not playing on a level field. Even the most skeptical of players may become convinced that it should be using the flashy, new **derivative instruments,** rather than be vulnerable to risk. If prices settle down (become less volatile), the growth of these markets may slow, but it is doubtful they will ever disappear. Once such markets are so highly developed, they will continue to be a means to capitalize on even small opportunities to reduce risk.

Derivative Instruments
Financial contracts (e.g., forwards, futures, options, and swaps) whose values are "derived" from the values of other underlying instruments, such as foreign exchange, bonds, equities, or an index.

Recap Swaps entail two parties trading interest payment streams to guarantee that the inflows of payments will more closely match the outflows. Thus, an intermediary with fixed-rate assets and variable-rate liabilities will trade with another intermediary that has variable-rate assets and fixed-rate liabilities. By trading interest payment streams, both reduce interest rate risk.

INTEREST RATE CAPS, FLOORS, AND COLLARS

In addition to the securitization process and the creation of interest rate swaps, a variety of other interest rate agreements have emerged to assist with the management of interest rate risk. These include interest rate caps, floors, and collars. Like interest rate swaps, these instruments help firms reduce income fluctuations caused by movements in interest rates. They also allow financial institutions to hedge against interest rate risk without requiring a firm to restructure its balance sheet. From reading about option contracts in

Chapter 23, you should have a conceptual framework of how these instruments work. Options allow a buyer to hedge against adverse price movements by giving the buyer the right, but not the obligation, to buy or sell an asset in the future at a strike price determined today. Interest rate caps, floors, and collars do the same thing, but become effective based on changes in interest rates rather than changes in asset prices.

Interest Rate Caps

Imagine that you are managing First South-Western Bank. Remember from Chapter 22 that most banks have a negative income gap—the amount of their interest-rate-sensitive assets (i.e., commercial loans, mortgages, and security holdings) is less than the amount of their interest-rate-sensitive liabilities (i.e., checkable, savings, money market, and time deposits and other forms of borrowing). This means that higher interest rates will reduce bank income because deposit rates will re-price (increase) faster than loan rates for the bank's portfolio as a whole. If interest rates fall, your bank's income will rise because the deposit rates (the cost of funds) will re-price more quickly than loan rates. Your asset-liability committee wishes to hedge against the possibility of higher interest rates, but does not want to sacrifice the possibility of benefiting from lower interest rates. Strategies discussed in Chapter 22 such as seeking less interest-rate-sensitive liabilities and more interest-rate-sensitive assets would reduce the problems caused by higher interest rates. Securitizing some of your assets or engaging in an interest rate swap would also be reasonable alternatives. However, all of these strategies would also reduce the benefit that would be gained from lower interest rates. Is the asset-liability committee asking you to do the impossible?

Fortunately, the answer is no. These apparently contradictory goals of reducing risks associated with higher interest rates without losing the benefits of lower interest rates can be achieved. One way to achieve these goals is to purchase an **interest rate cap**—an agreement whereby the seller of the cap agrees, for a fee, to compensate the cap buyer when an interest rate index (the reference rate) exceeds a specified strike rate. Agreements often specify LIBOR as the reference rate. The **strike rate** is simply the interest rate specified in the agreement.

Interest Rate Cap
An agreement whereby the seller of the cap agrees, for a fee, to compensate the cap buyer when an interest rate index exceeds a specified strike rate.

Strike Rate
The agreed-upon rate in an interest agreement.

The amount of compensation due the buyer, if any, is determined by the principal amount specified in the agreement and the degree to which the interest rate index exceeds the strike rate. By purchasing this interest rate cap, the committee can achieve its desire to reduce the risks associated with higher interest rates without eliminating the benefits of lower interest rates. Of course, a premium or fee has to be paid to achieve this risk reduction. A buyer of an interest rate cap is often a bank that would be adversely affected by higher interest rates. In that event, the payments received from the interest rate cap partially offset the loss of income caused by the higher costs of attracting deposits.

24-5
A Simple Interest Rate Cap

Principal amount = $10 million
Premium = 3% of $10 million principal = $300,000
Payments received from an interest rate cap = (LIBOR – strike rate) × (principal amount)

	YEAR 1	YEAR 2
LIBOR (reference rate)	8%	9%
Strike rate	6%	6%
Payments received	$200,000	$300,000

The example illustrated in Exhibit 24–5 will make this clearer. Let's assume that First South-Western agrees to buy a two-year, $10 million interest rate cap from ITP Capital. The parties agree to settle once per year, employ a strike rate of 6 percent, and use a particular one-year interest rate as the reference rate. The premium for this contract is 3 percent of the principal amount ($10 million × 0.03 = $300,000), or $300,000. First South-Western pays this fee with the understanding that if the interest rate exceeds the 6 percent strike rate, First South-Western will be compensated by ITP Capital. In effect, by buying a cap, a ceiling rate is placed on the cost of funds. Higher interest rates will increase the cost of funds, but they will also increase the compensation from the interest rate cap.

Total compensation is determined by the difference between the actual interest rate and the strike rate multiplied by the principal amount of the transaction. Let's assume that the interest rate 1 year from now is 8 percent and the rate 2 years from now is 9 percent. In year 1, ITP Capital will pay the difference between the actual and strike rates: (8 percent – 6 percent) × $10 million = $200,000. In year 2 it will pay (9 percent – 6 percent)×$10 million=$300,000. Thus, over the two-year period, ITP Capital pays First South-Western $500,000. This is $200,000 more than the $300,000 fee First South-Western paid for the cap. If the interest rate had remained below the strike rate, ITP Capital would have made no payments to First South-Western despite the fee paid. If interest rates had been higher, ITP Capital would have been paid even more. Regardless of what happens with actual interest rates, First South-Western is able to reduce the possibility of lower income resulting from higher interest rates and retain the possibility of benefiting from lower interest rates by purchasing an interest rate cap.

Interest Rate Floors

One can easily imagine the opposite case with a bank facing risks caused by lower interest rates. For example, a credit card bank has a positive income gap caused by more interest-rate-sensitive assets (floating-rate credit card receivables) than interest-rate-sensitive liabilities (fixed-rate bonds outstanding). An increase in interest rates would lead to higher credit card rates, enhancing the bank's revenue stream. However, higher short-term rates would have little or no effect on the bank's cost of funds. Lower interest rates would be a problem. Credit card rates could float downward while the bank's costs of funds remain unchanged, thus narrowing or reversing the interest rate spread. This bank could hedge against falling interest rates by engaging in a securitization, restructuring its balance sheet, or employing an interest rate swap. However, all of these solutions would also limit the bank's ability to profit from higher future interest rates. To avoid the downside risk of lower rates without eliminating the upside potential of higher rates, our bank can buy an interest rate floor.

Interest Rate Floor
An agreement whereby the seller of the cap agrees, for a fee, to compensate the cap buyer when an interest rate index falls below a specified strike rate.

An **interest rate floor** is an agreement whereby the seller of the floor agrees, for a fee, to pay the buyer of the floor when the actual interest rate falls below the strike rate. Like a cap, the amount of compensation in a floor is determined by the difference between the actual interest rate and the strike rate multiplied by the principal amount of the transaction. Our seller will pay only if interest rates fall below the strike rate. Let's again assume that First South-Western (here, our credit card bank) is the buyer and the ITP Capital is the seller. The terms are the same except that this is now an interest rate floor instead of an interest rate cap. In effect, when buying a floor, a guaranteed minimum rate of return is ensured on earnings. This example is illustrated in Exhibit 24–6.

Let's assume that First South-Western agrees to buy a two-year, $10 million interest rate floor from ITP Capital. The parties agree to settle once per year, employ a

24-6
A Simple Interest Rate Floor

Principal amount = $10 million
Premium = 3% of $10 million principal = $300,000
Payments received from an interest rate floor = (strike rate – LIBOR) × (principal amount)

	YEAR 1	YEAR 2
LIBOR (reference rate)	4%	4.5%
Strike rate	6%	6%
Payments received	$200,000	$150,000

strike rate of 6 percent, and use a particular one-year interest rate as the reference rate. The premium for this contract is 3 percent of the principal amount ($10 million × 0.03 = $300,000), or $300,000. First South-Western pays this fee with the understanding that if the interest rate falls below the 6 percent strike rate, First South-Western will be compensated.

Let's assume that the interest rate one year from now is 4 percent and the rate 2 years from now is 4.5 percent. In year one, ITP Capital will pay the difference between the actual and strike rates: (6 percent – 4 percent) × $10 million = $200,000. In year two it will pay (6 percent – 4.5 percent) × $10 million = $300,000. Thus, over the two-year period in nominal terms, ITP Capital pays First South-Western $350,000. The fee paid was $300,000, so First South-Western gained $50,000 in this transaction. If interest rates had been lower, ITP Capital would have paid even more. If the interest rate had remained above the strike rate, the premium would still have been paid and ITP Capital would have made no payments to First South-Western.

Why would a financial institution be willing to sell an interest rate cap or floor? A seller of an interest rate cap would typically be a financial institution whose financial analysis department has predicted stable or lower future interest rates. If the prediction is correct, it receives the cap fee and makes no payments. Alternatively, it may be a firm that, because of its balance sheet structure, would be hurt by lower rates. Thus, it is hedging against this scenario by selling the interest rate cap. If rates do fall, the income from the rest of its portfolio may fall, but the fee income from the interest rate cap would partially offset this effect and no payments would need to be made to compensate the buyer. In contrast, the seller of an interest rate floor expects stable or higher interest rates. If the seller is correct, it receives the fee for the floor and makes no payments to the buyer. Similarly, the seller of an interest rate floor may be a firm hurt by higher rates. By selling a floor, income is generated to help offset the losses occurring elsewhere on the firm's balance sheet. Appreciating the motivations of both buyer and sellers helps us to understand why firms buy an interest rate cap and sell an interest rate floor simultaneously.

Interest Rate Collars

An interest rate collar is created when one simultaneously buys an interest rate cap and sells an interest rate floor. Think back to the two examples given in our discussion of interest rate ceilings and floors. If a financial manager believes that interest rates are going to rise, it makes sense to pay the fee to buy an interest rate cap. If one is especially confident, he or she can simultaneously sell an interest rate floor. The income generated

from the sale of the floor may partially or fully offset the fee paid to purchase the interest rate cap in the first place. As long as the prediction of higher interest rates holds, the holder of the collar will generate earnings. If interest rates do fall, the seller of the floor will need to pay the buyer the compensation contractually due. However, in most circumstances, this will not be an undue burden. Typically, as discussed in our interest rate cap example, lower interest rates increase a bank's ordinary earnings by lowering the cost of funds faster than the earnings on loans. Thus, a collar may be an effective way for a bank to hedge against interest rate risk.

CURRENCY SWAPS

Currency Swaps
Agreements whereby one party agrees to trade periodic payments, over a specified period of time, in a given currency, with another party who agrees to do the same in a different currency.

Just as interest rate swaps, caps, floors, and collars have proliferated for managing interest rate risk, **currency swaps,** forwards, futures and options have originated to help financial institutions manage the adverse effects of currency movements.

Currency swaps are an agreement whereby one party agrees to trade periodic payments, over a specified period of time, in a given currency, with another party who agrees to do the same in a different currency. Currency swaps function like a series of currency future contracts. The difference is that rather than contracting for a single time period, a swap can be used to hedge against foreign-exchange-rate risk over a multiyear period.

Like many financial innovations, currency swaps originally developed as a means to circumvent regulation. In the past, many countries employed capital controls to encourage greater foreign investment by domestically based foreign subsidiaries. By delaying the conversion of foreign-denominated earnings into a parent company's domestic currency, countries hoped that foreign subsidiaries would engage in increased investment within the country. Imagine a U.S. soft drink company with bottling and sales operations in China. If China delays the conversion of yuan into dollars, the bottling company will forgo interest earnings it could earn if it could convert yuan to dollars now. China hopes that delay will encourage the bottling company to invest its yuan within the country to foster economic development. However, American corporations have found ways to get around this regulation.

To avoid both lost interest earnings and investing in China, it makes sense for the soft drink company to engage in a currency swap. This is arranged in three steps: (1) Our bottling company borrows using a yuan-denominated bond issue or loan; (2) it asks another company to borrow using a dollar-denominated bond issue or loan; and (3) the two companies "swap" the proceeds from their respective loans. They do not, however, swap the repayment of their loans. Our bottling company pays off its loan with funds from its Chinese operations. Similarly, the other company pays off its loans in dollars from its ongoing operations. Both companies get immediate access to the currency that they want and innovate around the capital control regulations.

In addition to avoiding capital controls and allowing for the multi-year hedging of foreign-generated earnings, currency swaps can, under certain circumstances, create profitable opportunities for intermediation and reduced borrowing costs.

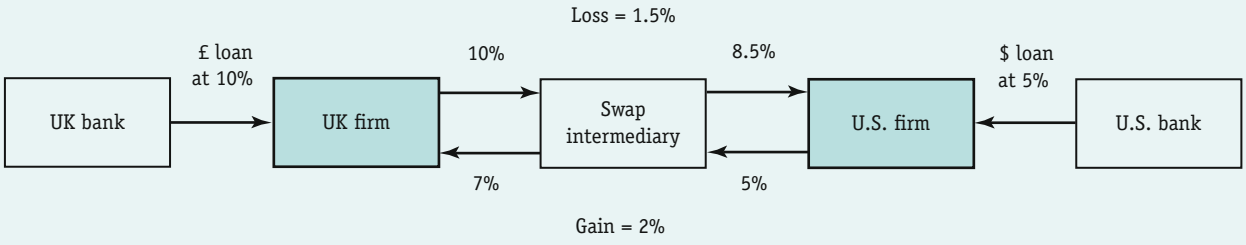
Imagine a U.S. company that wants to build an office complex in London. At the same time, a UK company wants to build a new strip mall in Los Angeles. Each of these projects will cost $30 million dollars, or 15 million pounds at the current exchange rate of $1 = £0.5 (or £1 = $2). For the sake of simplicity, we assume the loans (or bond issues) are interest-only for five years and the principal is repaid at maturity. To pay for its project in pounds, the U.S. firm could either (1) issue a fixed-rate, £60 million-denominated bond in the United Kingdom, or (2) a fixed-rate, $30 million dollar-denominated bond in

24-7
Structure and Potential Benefits of a Currency Swap

Suppose that a U.S. and a UK firm can borrow in their respective countries for five years at the following fixed rates of interest:

	$	£
U.S. firm	5.0%	***9.5%***
UK firm	***8.0%***	10.0%

Structure and potential benefits of a currency swap



the United States and then convert the proceeds into pounds to pay for the new office complex. The UK firm engaging in the U.S. mall project faces similar choices in obtaining dollars. It could either (1) issue a fixed-rate, $30 million dollar-denominated bond in the United States, or (2) a fixed-rate, £15 million denominated bond in the United Kingdom and then convert the proceeds into dollars to pay for construction of the new mall.[5] Which of these options is the best for each firm?

As with many things in finance, it depends. Exhibit 24–7 summarizes the hypothetical loan rates facing each of our firms in each country and the structure of a currency swap. The U.S. firm has a higher credit rating and can borrow more cheaply in both the U.S. and UK markets. However, the U.S. firm has a bigger comparative advantage in the United States (3 percentage points, or 8.0 percent – 5.0 percent) than it does in the United Kingdom (0.5 percentage point, or 10.0 percent – 9.5 percent). This might be because the U.S. firm is better known in the United States than it is in the United Kingdom. Note that in this particular example, interest rates for both firms are higher in the United Kingdom than in the United States.

If the U.S. firm borrows in pounds (at 9.5 percent) and the UK firm borrows in dollars (at 8 percent), they will be paying a combined interest rate of 17.5 percent (9.5 percent + 8.0 percent = 17.5 percent). If, instead, each firm borrows in its home country and engages in a currency swap, both can reduce their borrowing costs. The U.S. firm can borrow dollars at 5 percent and the UK firm can borrow pounds at 10 percent. In this case, the total interest paid is 15 percent (5 percent + 10 percent = 15 percent). Thus, the firms can reduce the annual interest payments by 2.5 percentage points by borrowing in their own currencies and then swapping the proceeds.

Examine the bottom half of Exhibit 24–7 beginning at the far left. The UK bank lends £15 million to a UK firm at a 10 percent interest rate. The UK firm, in turn, lends

the loan proceeds to an intermediary coordinating the swap at the same 10 percent interest rate. The intermediary takes these pounds and loans them to the U.S. firm at 8.5 percent. This 8.5 percent rate is 1 percentage point lower than the 9.5 percent rate the U.S. firm could get in the UK market on its own. It also means that the intermediary takes a loss of 1.5 percent on this loan. Before you dismiss the intermediary's sanity, we need to also examine the bottom half of Exhibit 24–7 from right to left. A U.S. bank lends $30 million to a U.S. firm at a 5 percent interest rate. Like its English counterpart, the U.S. firm lends its dollars to the swap intermediary at the same 5 percent interest rate. The intermediary in turn lends these dollars at a 7 percent interest rate to the UK firm. This 7 percent rate is 1 percentage point lower than the UK firm would have had to pay borrowing on its own. Here, the intermediary also makes a gain of 2 percent by borrowing dollars at 5 percent from the U.S. firm and then lending them to the UK firm again at 7 percent. Thus, this 2 percentage point gain minus the earlier 1.5 percentage point loss leaves the intermediary 0.5 percent ahead of where it started. In summary, the U.S. firm borrows pounds at an interest rate 1 percent below what it otherwise could have obtained, the UK firm borrows dollars at an interest rate 1 percentage point lower than it could otherwise, and the shrewd intermediary who arranged the entire transaction receives a net 0.5 percent spread.

The currency swap has allowed our firms to borrow at lower rates. However, both firms remain exposed to considerable exchange-rate risk. The UK firm has to make five annual loan payments on a dollar-denominated loan and repay the $30 million in principal in five years. If the dollar appreciates during this period, it will take even more in pound terms to repay the loan. Similarly, our U.S. firm has to make five annual payments on a pound-denominated loan and pay back £15 million in principal. If the pound appreciates, it will take even more dollars than expected to repay the loan. The good news is that this exchange rate risk exposure can be completely discharged. If the U.S. firm agrees to make the UK firm's interest and principal payments and the UK firm agrees to make the U.S. firm's interest and principal payments, the exchange rate risk is eliminated. Thus, under certain circumstances, firms borrowing in their home markets, "swapping" their initial loan proceeds, and then again "swapping" their payment obligations, can lead to lower borrowing costs and provide multi-year protection from exchange-rate risk.

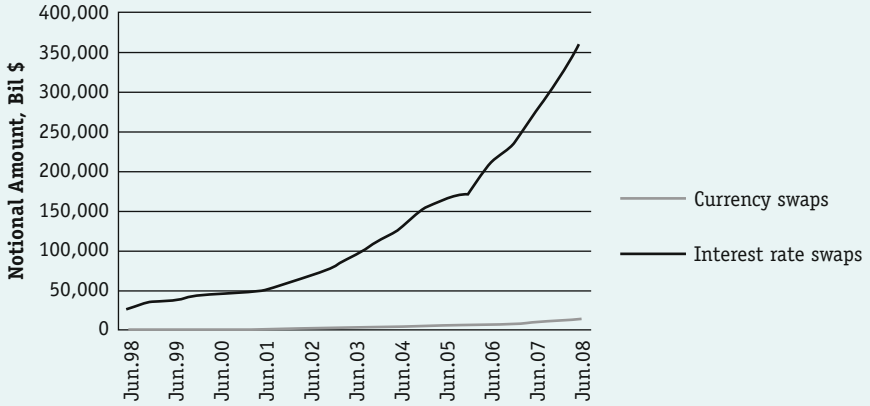
Trends in Interest Rate Agreements and Currency Swaps

The Bank for International Settlements (BIS) reports that interest rate swaps are the largest component of the global over-the-counter (OTC) derivative market. Exhibit 24–8 shows the notional amount outstanding as of the end of June 2008 was $356.8 trillion, an increase from $169.1 trillion at the end of 2005 and $48.8 trillion at the end of 2000. Exchange rate swaps, though much smaller in size than interest rate swaps, also continued to grow. The notional amount of currency swaps outstanding as of the end of June 2008 was $16.3 trillion, an increase from $8.5 trillion at the end of 2005 and $3.2 trillion at the end of 2000.[6] Notional principal is the base amount used for calculating the exchange of payments (we refer to it as simply the principal amount in our examples of caps and floors). This greatly overstates the amount of market risk, but serves as a useful yardstick for measuring changes over time.

Although the financial crisis reduced the use of some financial derivatives, such as credit default swaps, interest rate and currency swaps continued to grow. As global trade and investment expand and users become increasingly sophisticated in their risk management strategies, the popularity of these instruments seems likely to continue.

24-8

Interest Rate Swaps and Currency Swaps, billions $, Notional Amounts



Source: Bank for International Settlements, *Quarterly Review*, December 2008, Table 19.

Recap

Interest rate caps, floors, and collars can be used to manage interest rate risk when securitization, interest rate swaps, or balance sheet restructuring is inappropriate. An interest rate cap is an agreement whereby the seller of the cap agrees, for a fee, to compensate the cap buyer when an interest rate index exceeds a specified strike rate. In contrast, an interest rate floor is an agreement whereby the seller of the floor agrees, for a fee, to pay the buyer of the floor when the actual interest rate falls below the strike rate. In either case, the amount of compensation is determined by the difference between the actual interest rate and the strike rate multiplied by the principal amount of the transaction. An interest rate collar is created when one simultaneously buys an interest rate cap and sells an interest rate floor. Currency swaps are used to reduce a firm's exposure to foreign exchange risk. The main benefit of currency swaps over currency future contracts is that swaps can be done for multiple-year periods whereas future contracts are used to hedge foreign exchange risk for shorter periods of time. The volume of interest rate agreements and currency swaps continues to increase dramatically, even despite the global financial crisis.

CONCLUSION

This concludes our three-chapter practical introduction to financial risk assessment and management. We have discussed essential risk assessment techniques, (applying the Five Cs of credit and income gap analysis), financial instruments (forwards, futures, options, swaps), and risk management strategies (balance sheet restructuring and securitization) that can be used to manage credit, interest rate, liquidity, and exchange rate risks. This subject matter is essential for the effective financial manager and the overall efficiency of our financial system.

The final two chapters of the text (Chapters 25 and 26) will explore the international financial system and the conduct of monetary policy in a globalized financial environment.

Summary of Major Points

1. Securitization, interest rate agreements (swaps, floors, caps, and collars), and currency swaps can be used to manage various kinds of risk. However, issuers and purchasers of these various instruments need to understand and employ these instruments correctly to manage risk and avoid losses.
2. The process of securitization involves a variety of important players, including borrowers, a loan originator, a special-purpose trust, a rating agency, a credit enhancer, an underwriter, and financial investors. Securitization can reduce transaction costs associated with financial intermediation through the pooling of financial obligations, prudent credit enhancement, favorable credit rating, and appropriate structuring of tranches.
3. The benefits of securitization can include lower borrowing costs for borrowers, enhanced earnings and customized investment vehicles for investors, and risk reduction and earnings for issuers.
4. Securitization shifts risk in ways that may not be understood by those affected. If investors rely on rating agencies, and these agencies improperly measure risk of underlying mortgage- (or asset-) backed securities, then lenders may have an incentive to inappropriately lower lending standards—increasing defaults and reducing the value of associated assets.
5. Securitization began in response to a shortage of funds for mortgages during the 1970s and 1980s. Tax law changes, the creation of government-sponsored enterprises, and technological advances in computing further facilitated this process. Over time, securitization has spread to many other types of asset-backed issues, including home equity loans, automobile loans, credit cards, commercial loans, student loans, and manufactured housing loans.
6. Interest rate swaps allow two parties to trade interest payment streams such that their interest inflows more closely match their outflows. An intermediary with fixed-rate assets and variable-rate liabilities will trade with another intermediary that has variable-rate assets and fixed-rate liabilities. The result is that both parties to the agreement reduce their risk exposure.
7. The seller of an interest rate cap agrees, for a fee, to compensate the buyer of an interest rate cap whenever an interest rate index exceeds a specified strike rate. The seller of an interest rate floor agrees, for a fee, to pay the buyer of the interest rate floor when the actual interest rate falls below the strike rate. The amount of compensation due to the buyer in either situation is determined by the difference between the actual interest rate and the strike rate, as well as the principal amount of the transaction. An interest rate collar is created when one simultaneously buys an interest rate cap and sells an interest rate floor.
8. Currency swaps are used to reduce a firm's exposure to foreign exchange risk. The main benefit of swaps over currency future contracts is that swaps can be done for multiple-year periods whereas future contracts involve shorter time periods.
9. Although the volume of mortgage-backed and especially asset-backed securities began to fall in 2008, interest rate agreements and currency swaps continued to be widely used despite the current turmoil in financial markets.

Key Terms

Asset-Backed Securities, p. **590**
Credit Enhancer, p. **592**
Currency Swaps, p. **604**
Derivative Instruments, p. **600**
Due Diligence, p. **592**
Home Equity Loan, p. **594**
Interest Rate Cap, p. **601**
Interest Rate Floor, p. **602**
Interest Rate Swaps, p. **598**
Special Purpose Trust, p. **592**
Strike Rate, p. **601**
Superior/Subordinated Debt Structure, p. **593**
Tranche, p. **593**

Review Questions

1. What are the costs and benefits of securitizing South Dakota's tobacco revenue? How might the possibility of securitizing future state revenues allow politicians to pursue policies with short-run benefits, but not long-run.
2. What different kinds of assets "back" asset-backed securities?
3. Describe the historical trend in total asset-backed securities outstanding between 1985 and 2008.
4. What financial, legal, institutional, and technological changes encourage and facilitate the use of securitization?
5. Why is the trust structure important to the securitization process? How has it shifted risk?
6. How can credit enhancement and a superior/subordinated debt structure be used to allow an A-rated company to issue AAA-rated securities?
7. How can borrowers, issuers, and investors benefit from the securitization process, at least in theory? Who has lost from the securitization process in recent years? Why?
8. What is a tranche? If you are risk averse, would you be more likely to invest in a subordinated or superior tranche? Why might an investor want to invest in a subordinated tranche?
9. Why would a bank with variable-rate money market deposits and fixed-rate, long-term mortgages enter into an interest rate swap with another bank that has long-term, fixed-rate deposits and short-term, variable-rate mortgages? How would each benefit?
10. What advantage do interest rate caps or floors have over interest rate swaps?
11. What is an interest rate collar? Under what circumstances would a financial manager employ one?
12. What is a currency swap? How does it differ from a currency futures contract?

Analytical Questions

13. Explain the role played by each of the seven types of players in the securitization process.
14. Imagine two banks: Bank A has short-term, variable-rate deposits and long-term, fixed rate mortgages; Bank B has fixed-rate, long-term deposits and short-term, variable-rate mortgages. Which would be harmed by an increase in interest rates? Which would be harmed by a decrease in interest rates?
15. Which of the two banks described in question 14 would most likely buy an interest rate cap? Why? Which would be most interested in buying an interest rate floor? Why?
16. First South-Western agrees to buy a two-year, $20 million interest rate cap, settled once a year, from ITP Capital. The strike rate is 5 percent. The premium is 2.5 percent of the principal amount. The interest rate 1 year from now is 7 percent and 2 years from now is 4 percent. How much will First South-Western pay for this contract? How much will First South-Western receive from ITP Capital in years 1 and 2?
17. First South-Western agrees to buy a two-year, $25 million interest rate floor, settled once a year, from ITP Capital. The strike rate is 4 percent. The premium is 2.5 percent of the principal amount. The interest rate 1 year from now is 5 percent and 2 years from now is 3 percent. How much will First South-Western pay for this contract? How much will First South-Western receive from ITP Capital in years 1 and 2?
18. Assume that First South-Western enters into an interest rate collar. It buys an interest rate cap like that described in question 16 and simultaneously sells an interest rate floor to West Capital that has the following characteristics: two-year, $20 million interest rate floor, settled once a year. The strike rate is 3 percent. The premium is 2 percent of the principal amount. The interest rate 1 year from now is 7 percent and 2 years from now is 4 percent. How much will First South-Western pay for these contracts? How much will First South-Western receive in years 1 and 2?

Suggested Readings

The article "States Squander Chance to Fight Smoking," *USA Today*, March 1, 2003, provides a postscript to the securitization of tobacco settlement funds that begins this chapter. It explains how the possibility of securitization enabled states to use the settlement for funding of "pet projects" rather than programs to reduce smoking or mitigate the damage done to smokers by their addiction, as intended. By 2003 seven states had followed the lead of South Dakota and securitized at least part of their settlement. "Room for Growth Seen in Tobacco Bond Deals," *Asset Securitization Report*, May 21, 2007, reports that by 2007 this number had grown to nineteen. It is interesting to contrast the viewpoint of these two articles; the first focusing on how securitization could enable shortsighted politicians to thwart the intent of the settlement, and the second on how it provides opportunities for financial firms involved in the securitization process to benefit.

A trio of insightful articles from the *Economist* provides perspective about how securitization and the deregulation that enabled it contributed to the current financial crisis. "Link By Link—A Short History Of Modern Finance," October 16, 2008, confronts the belief that financial market liberalization is responsible for the financial crisis and argues that this view is only partially correct. "Wild-Animal Spirits—Why Is Finance So Unstable?" January 22, 2009, examines how securitization can contribute to asset price bubbles. And "Ruptured Credit—Securitization Has Its Flaws, But Many of Them Can Be Mitigated," May 15, 2008, addresses the adverse affects of shifting risk off-balance sheet.

How did the subprime mortgage meltdown of 2007 become the financial crisis of 2008? Gary Gorton attempts to answer this question in "The Panic of 2007," NBER Working Paper no. 14358, September 2008.

Origins of the financial crisis are examined in "The 2007 Meltdown in Structured Securitization: Searching for Lessons, Not Scapegoats," World Bank Policy Research Working Paper no. 4756, September 2008, by Gerary Caprio, Asli Demirguc-Kunt, and Edward Kane. They find that contradictory political and bureaucratic incentives undermined effective regulation, and identify reforms that would mitigate these problems.

For a short primer on interest rate swaps, consult "Bond Basics: What Are Interest Rate Swaps and How Do They Work?" available online at **www.pimco.com.**

A book-length explanation of mortgage-backed securities directed toward investors is provided in *The Handbook of Mortgage-Backed Securities*, 6th ed., by Frank Fabozzi (New York: McGraw-Hill, 2005).

Peter L. Berstein asserts that "The revolutionary idea that defines the boundary between modern times and the past is the mastery of risk. . . ." His *Against the Gods: The Remarkable Story of Risk* (New York: John Wiley & Sons, 1996) is an engaging and entertaining history of our ability to measure and manage risk. He begins with the writings of the ancient Greeks and continues through a variety of writings by great thinkers such as Pascal, Fermat, Leibniz, Bernoulli, Knight, Keynes, von Neumann, Black, and Scholes. His history also gives us a longer-term perspective.

Endnotes

1. Although South Dakota was the first, it was by no means the last state to securitize its tobacco settlement payments. The article "Room for Growth Seen in Tobacco Bond Deals," *Asset Securitization Report*, May 21, 2007, reports that nineteen states had similar programs.
2. There is at least one exception to this. Sometimes a form of credit enhancement called "recourse to issuer" is used. If there were losses to the security buyers, the issuer could be held liable. In this case, the loan originator forfeits its bankruptcy remoteness in order to achieve a higher credit rating for the issue.
3. These include operating leases, equipment sales finance, floor plan, small business loans, and trade receivables.
4. We have included mortgage securitization in the totals for Exhibit 24–2. Some reserve the term "asset-backed securities" to refer solely to securitizations that are not backed by traditional mortgages. We use the term "specialty lending asset-backed securities" to refer to ABS lending that excludes mortgage-backed lending.

5. Either or both of our firms could engage in variable-rate borrowing. If one used fixed-rate and the other variable-rate financing, they could combine an interest rate swap with a currency swap. This combination of instruments is called a cross-currency swap. We ignore these instruments for ease of exposition and because our students find currency swaps complicated enough. We have also simplified this example by making the principal amounts of the loans for both firms the same. However, this does not materially change our results.
6. The Bank for International Settlements www.bis.org/publ/otc_hy0811.htm in its "Regular OTC Derivatives Market Statistics," published in November 13, 2008, provides international data on derivatives such as interest rate and foreign exchange swaps as of June 30, 2008.

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PART 7

The International Financial System

25 The International Financial System

26 Monetary Policy in a Globalized Financial System

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CHAPTER TWENTY-FIVE 25

The dollar is our currency, but your problem.

—John Connolly, U.S. treasury secretary
to his European counterparts, 1971

The International Financial System

Learning Objectives

After reading this chapter, you should know:

How and why the international financial system is changing

The role of the international financial system under the Bretton Woods Accord

How the present managed floating exchange rate system works

The role the dollar plays in the international financial system

The birth and growing importance of the euro

The roles of the International Monetary Fund, the World Bank, and the Bank for International Settlements

A DRAMATIC METAMORPHOSIS

International Financial System
The numerous rules, customs, instruments, facilities, markets, and organizations that enable international payments to be made and funds to flow across borders.

The **international financial system** consists of the numerous rules, customs, instruments, facilities, markets, and organizations that enable international payments to be made and funds to flow across borders. In recent years, the international financial system has experienced tremendous growth. New financial instruments have been created, and the volume of transactions has exploded. The dramatic metamorphosis of international financial markets is driven by technological changes, the growth in world trade, and the breakdown of barriers to financial (capital) flows.

From an economic standpoint, developments in the international financial system have made financial markets more efficient because funds (financial capital) can more easily flow around the world to wherever they will earn the highest return. Over time, as resources are allocated more efficiently, both developed and developing countries should experience increased economic growth. As a result, living standards around the world should rise more than they otherwise would have.

A more globalized environment can also entail costs. A disturbance in one financial market or in one country can have immediate effects on other countries and the entire international financial system. As Alan Greenspan once put it, "These global financial markets, engendered by the rapid proliferation of cross-border financial flows and products, have developed a capability of transmitting mistakes at a far faster pace throughout the financial system in ways that were unknown a generation ago."[1] An example is the turmoil in international capital markets during 2007 and 2008 caused by declining real estate prices in the United States. Since much of the financing for subprime mortgages ultimately came from foreign banks and financial firms, they were some of the biggest losers. Between April and December of 2007, Japanese financial institutions lost over $5.5 billion in the U.S. subprime mortgage market. Banks with the largest write-offs over this period include Swiss-based bank UBS, with losses totaling $11.45 billion for the last three months of 2007, and Bank of China, with losses expected to total $2.79 billion. By the summer of 2008, financial markets around the world were reeling as the crisis spread from the mortgage markets to global financial markets at large.

The international financial system includes the international money and capital markets and the foreign exchange market. The international money market trades short-term claims with an original maturity of one year or less; the international capital market trades capital market instruments, including stocks, bonds, mutual funds, and mortgages, with an original maturity of more than one year. In recent years, many new international financial products have been created to facilitate the increased financial flows. These include various types of mutual funds that allow individuals to invest in developed and emerging economies.

A crucial part of the international financial system is the foreign exchange market, where foreign currencies are bought and sold in the course of trading goods, services, and financial claims (securities) among countries. As you have seen in earlier chapters, this global market is woven together by the dealers in foreign currencies—mostly, the foreign exchange departments of the largest commercial banks located in the world's major financial centers such as New York, London, Frankfurt, and Tokyo. By April 2007, the average daily volume in foreign exchange markets was $3.2 trillion, an increase of over 70 percent from three years before.

In the post–World War II period, the international financial system has operated under two distinct exchange rate regimes. The specific exchange rate regime affects the trading of all international financial instruments. During the first regime from 1944 to 1973, major industrial countries maintained a system of fixed exchange rates, and currency values rarely changed. Under the second regime, which has been in effect since

1973, exchange rates fluctuate daily in response to changes in supply and demand (market forces). As we shall see, governments also intervene in this flexible exchange rate system.

In the preceding chapters on financial markets, we discussed many aspects of the international financial system, and in Chapter 8 we directly considered the market for foreign exchange. In this chapter, we examine the international exchange rate systems in effect since 1944. These exchange rate systems provide a framework in which the international financial system operates. We also discuss the unique role that the dollar still plays in the international financial system. Finally, we look at the international organizations that seek to provide a framework for financial stability as the cross-border trading of all types of financial instruments continues to grow.

THE INTERNATIONAL FINANCIAL SYSTEM FROM 1944 TO 1973

Fixed Exchange Rate System
An exchange rate system in which currency values do not fluctuate.

Official Reserve Currency
The currency used by other countries to define their own currency; the U.S. dollar was the official reserve currency under the Bretton Woods Accord.

Bretton Woods Accord
A 1944 agreement negotiated by the major industrialized countries that established fixed exchange rates with the U.S. dollar serving as the official reserve currency.

From the end of World War II until the early 1970s, the major economies of the world participated in a **fixed exchange rate system,** with the U.S. dollar functioning as the **official reserve currency.** Other countries defined their currencies in terms of the U.S. dollar and agreed to buy or sell dollars to maintain the agreed-upon exchange rates.[2] The dollar, in turn, was defined in terms of gold. During the postwar period, 1 ounce of gold was set equal to $35, and the United States agreed to convert any unwanted dollars of foreign central banks into gold. In cases of fundamental imbalances, an orderly procedure was established to make adjustments in exchange rates and thereby avoid the disruptive changes that had occurred between World War I and World War II

This fixed exchange rate system was established by the **Bretton Woods Accord** of 1944, which was worked out by representatives from the major industrialized countries who met at Bretton Woods, New Hampshire, to design a new international financial system. Under the Bretton Woods Accord, if the trade deficit of a country other than the United States increased, that country effectively increased the supply of its currency in international markets. The increased supply put downward pressure on the exchange rate. To maintain the agreed-upon exchange rate, the country's central bank had to purchase the excess supply of its currency using dollars.

An example will help clarify this concept. Assume that the exchange rate between the dollar and the British pound was set at $\$1 = 1/2 = .5$ pounds, but supply and demand were causing the market value of the two currencies to gravitate to $\$1 = 2/3 \cong .67$ pounds. Perhaps, ceteris paribus, Britain's trade deficit had increased significantly in recent months, causing Britain's balance of payments on current and capital accounts to move into a deficit position.[3] The smaller supply of dollars relative to pounds in international markets puts upward pressure on the exchange rate of the dollar, while the larger relative supply of pounds puts downward pressure on the value of the pound. In such a case, the Bank of England, the central bank of Great Britain, would intervene in the market by buying pounds with dollars until the market value of the two currencies converged at the agreed-upon exchange rate. By changing the supply of dollars and pounds outstanding, the Bank of England could manipulate the market value of the dollar in terms of the pound. In this manner, the values of the dollar and the pound could be maintained at the agreed-upon exchange rate of $\$1 = .5$ pounds.

Official Reserve Account
The balance of payments account that records official government transactions in the foreign exchange market to bring the balance of payments into balance.

Such government transactions in foreign currencies were measured in the **Official Reserve Account** of the balance of payments. We ignored this account in Chapter 8. You can now see that by supplying dollars and demanding pounds, the Bank of England would run a surplus in the Official Reserve Account that would just equal the deficit in the current and capital accounts of the balance of payments. Hence, under fixed exchange

Looking Out

The Gold Standard

During the late nineteenth and early twentieth centuries, the United States, along with the other major world economies, was on a gold standard that lasted about 30 years. Under the gold standard, the amount of currency in circulation was backed by gold. Each country defined its currency in terms of gold and agreed to buy or sell unlimited quantities of gold at a preestablished price called the *par value*.

A gold standard is a type of fixed exchange rate system. For example, if one ounce of gold in the United States is equal to $20 and one ounce of gold in England is equal to 5 British pounds, then the pound/dollar exchange rate is .25; that is, $1 equals .25 British pounds. The dollar and the pound will always trade in this fixed ratio as long as both countries redeem their currencies in gold at the par value.

A gold standard comes under strain if countries experience different growth rates. For instance, suppose that a gold standard was in existence and that the United States was growing faster than its neighbors. In that case, the United States would find that imports were increasing faster than exports. In the foreign exchange market, the quantity supplied of dollars would be greater than the quantity demanded. Foreigners would present the dollars to the U.S. Treasury to be redeemed for gold, and the United States would lose its gold supply. As the United States lost gold, its money supply would fall with resulting depressing effects on output, jobs, and so on.

If policy makers wanted to keep the U.S. economy growing faster than economies in the rest of the world, they would be under pressure to devalue the U.S. currency. A devaluation is an increase in the number of dollars that must be presented to the Treasury to receive an ounce of gold. Fear of devaluation would cause more of the currency to be presented for redemption. Holders of dollars would convert the dollars to gold, and if devaluation did occur, they would convert the gold back to more dollars than they started with! This would exacerbate the gold loss and result in periodic financial crises as gold redemptions were suspended and the par values among currencies had to be redefined. In fact, scenarios like this actually occurred and led to the end of the gold standard.

rates, it was (and always is) official government transactions in foreign exchange markets that brought the balance of payments into balance at the fixed exchange rate.

Because the Bank of England was maintaining the fixed exchange rate by buying pounds with dollars, Great Britain could continue to maintain the fixed rate only so long as it had or could acquire sufficient dollars to support the value of its currency as needed. If Great Britain (or another foreign country) ran a persistent deficit in its current and capital accounts, its central bank would eventually run out of dollars and have to **devalue,** or decrease the value of, its currency in terms of the dollar in order to reflect the diminished value of the pound. Devaluation occurs when the monetary authorities reduce the value of a country's currency under a fixed exchange rate system. In terms of our analysis, the pound is devalued if the official rate is changed from $1

Devalue
Under a fixed exchange rate system, to decrease the value of a country's currency.

per .5 pounds to $1 per .67 pounds. At the original rate, each pound was worth $2, but at the latter rate, after the devaluation, each pound is worth about $1.5. The need to devalue could be accelerated if speculators sensed an impending necessity to devalue and consequently increased the supply of pounds from what it would be otherwise. The alternative to devaluing would be for Great Britain to run a severely contractionary policy designed to lower prices in pounds and make British goods more desirable. As exports increased and imports decreased, the value of the pound would be restored to the agreed-upon exchange rate.

As you have seen, in the decades immediately after World War II, the U.S. dollar served as the official reserve currency. Unlike Great Britain in our example, the United States was eventually in the unique position of being able to run persistent balance of payments deficits on the current and capital accounts. Initially, the United States was running sizable trade surpluses financed by capital outflows under the Marshall Plan. Foreign central banks sought to accumulate stockpiles of dollars to function as international reserves. During this period, a "dollar shortage" occurred as countries scrambled for dollars not only for reserves but also to rebuild their economies.

Once foreign central banks had acquired sufficient reserves, the ability of the United States to run chronic deficits in the balance of payments on current and capital accounts was also limited. In this case, the dollar, ceteris paribus, would become overvalued in terms of one or more foreign currencies. Under the Bretton Woods Accord, the United States would lose gold as the unwanted dollars were presented for conversion. The United States would then pressure foreign central banks to **revalue,** or increase the value of, their currency in terms of the dollar.

Revalue
Under a fixed exchange rate system, to increase the value of a country's currency.

Revaluation occurs when the monetary authorities increase the value of a country's currency under a fixed exchange rate system. For example, the pound is revalued if the official rate is changed from $1 = .67 pounds to $1 = .5 pound. In the original case, each pound was worth $1.50, while in the latter case, each pound is worth $2. Ceteris paribus, the revaluation would, in time, reduce the U.S. balance of payments deficit on current and capital accounts and slow the flow of unwanted dollars abroad. In turn, the gold outflow would diminish.

A foreign central bank might be hesitant to revalue, however, because revaluation could adversely affect its country's economy. Among other things, revaluation could reduce net exports and have a negative impact on employment. Note that whether the United States was running a persistent surplus or a persistent deficit in its balance of payments on current and capital accounts, the foreign central bank had to change the value of its currency in terms of the U.S. dollar. The foreign central bank had to act because, under the Bretton Woods Accord, if the United States changed the value of the dollar, the change would affect the relationship between the dollar and all other currencies, even though the dollar might have been out of alignment with only one or a few of the foreign currencies. Consequently, foreign central banks would pressure the United States to correct the imbalance by reducing its deficit on the current and capital accounts. Note the irony of the situation and the potential for a stalemate in which each country is pressuring the other to take action.

A balance of payments deficit on current and capital accounts could also be caused by increases in the capital outflows of a country, ceteris paribus. If a country experienced a net capital outflow, this had the same effect as an increase in the trade deficit of the same magnitude. Ceteris paribus, an increased net capital outflow from the United States comes from an increase in direct foreign investment by U.S. individuals or firms. Likewise, if a country experienced an increased net capital inflow, this had the same effect on the balance of payments on current and capital accounts as an increase in the trade surplus.

As you have seen in Chapter 8, ceteris paribus, such capital flows resulted from changes in domestic interest rates relative to foreign rates.

During the 1960s and 1970s, some countries, including the United States, expanded their economies and their domestic money supplies relatively faster than others, such as Japan and Germany. The United States experienced inflationary pressures in the mid- to late 1960s as a result of monetary and fiscal policies associated with the Great Society's War on Poverty and the Vietnam War buildup. Consequently, some central banks outside the United States accumulated more dollars than they wished to hold as reserve assets. Rather than revaluing their currencies, they asked the United States to convert these unwanted dollars to gold; up until 1971, foreign central banks could still receive gold from the Federal Reserve in exchange for their dollars.

As more and more central banks requested conversion, it became clear that the United States would not be able to continue to redeem the dollars in gold. Expecting a devaluation in the dollar, speculators rushed to change their dollars into currencies such as the West German mark. This caused the Bundesbank to stop providing marks for dollars. In late 1971, the United States suspended the international conversion of dollars into gold. At the same time, the dollar was devalued by setting the value of 1 ounce of gold equal to $42 rather than the $35 that had been in effect since the inception of the Bretton Woods Accord. Hence, the "official value" of the dollar was reduced from $1 = 1/35 ounce of gold to $1 = 1/42 ounce of gold, even though the United States was no longer redeeming dollars with gold, even for central banks. In 1973, most countries abandoned fixed exchange rates altogether, and the value of the dollar began to float. The Jamaica Agreement of 1974 officially adopted floating exchange rates, underscoring what had been done unofficially in 1973.

A final comment is in order. During the Bretton Woods period, the amount of cross-border trading of financial assets such as stocks, bonds, and mortgages was much lower than it is today. Under normal circumstances, exchange risk was minimal during this period, but many countries had capital controls that did not allow the purchase of foreign financial instruments. Also, technology was such that it did not foster cross-border financial flows.

Recap

The international financial system consists of the arrangements, rules, customs, instruments, facilities, and organizations that enable international payments to be made and funds to flow across borders. The international financial system includes the international money and capital markets and the foreign exchange market. The Bretton Woods Accord of 1944 established fixed exchange rates among major world currencies. The U.S. dollar, which was backed by gold, served as the official reserve currency, and other countries defined their currencies in terms of the dollar. If a country other than the United States had a deficit in its balance of payments, it used supplies of dollars to purchase its own currency to maintain fixed exchange rates. If a country other than the United States had a surplus in its balance of payments, it demanded dollars to maintain the value of its currency. The system broke down in late 1971, when the United States suspended the international conversion of dollars to gold. A flexible exchange rate system was adopted in 1973. In the Bretton Woods period, cross-border investment in financial instruments was much less frequent than it is today.

THE MANAGED FLOAT EXCHANGE RATE SYSTEM SINCE 1973

The demise of the Bretton Woods Accord initiated a new era in which the exchange rates of major industrialized countries are no longer fixed. Rather, these countries participate

Floating (Flexible) Exchange Rate System
An exchange rate system in which currency values are determined by supply and demand and fluctuate in response to changes in supply and demand.

in a **floating (flexible) exchange rate system,** in which exchange rates fluctuate by the minute and the hour as market forces change.

Like other major currencies, the exchange rate of the U.S. dollar is determined by demand and supply in international markets. The supply of dollars per month reflects the U.S. demand for foreign goods, services, and securities. Ceteris paribus, the quantity of dollars supplied is a positive function of the exchange rate. The demand for dollars reflects the foreign demand for U.S. goods, services, and securities. Ceteris paribus, the quantity demanded is a negative function of the exchange rate. The market gravitates to the equilibrium exchange rate where quantity demanded is equal to quantity supplied.

From an initial equilibrium, if U.S. incomes, U.S. inflation, or foreign interest rates rise, ceteris paribus, U.S. demand for foreign goods, services, and securities will increase, and so will the supply of dollars. The market will gravitate to a new equilibrium at a lower exchange rate that corresponds to a depreciation of the dollar.

Likewise, if foreign incomes, foreign inflation, or U.S. interest rates rise, ceteris paribus, foreign demand for U.S. goods, services, and securities will increase, and so will the demand for dollars. The market will gravitate to a new equilibrium at a higher exchange rate that corresponds to an appreciation of the dollar. Because we live in a very dynamic world, the factors that determine supply and demand are always changing. Hence, exchange rates change by the minute.

To summarize, factors such as domestic and foreign incomes, inflation rates, and interest rates affect exchange rates, and "flexible" exchange rates immediately adjust to changing market conditions and expectations. "A Closer Look" on p. 622 reviews the basics of exchange rate determination under flexible exchange rates as first presented in Chapter 8.

Our story does not end here, however. Market forces are not the only factor that affects exchange rates. In addition, central banks may intervene in the foreign exchange market by buying and selling currencies to influence exchange rates. Thus, the present international monetary system can be more correctly characterized as a **managed float exchange rate system** because exchange rates are allowed to fluctuate in accordance with supply and demand; however, central banks may intervene if a currency is thought to be over or undervalued. This system is distinctly different from the fixed exchange rate system under the Bretton Woods Accord.

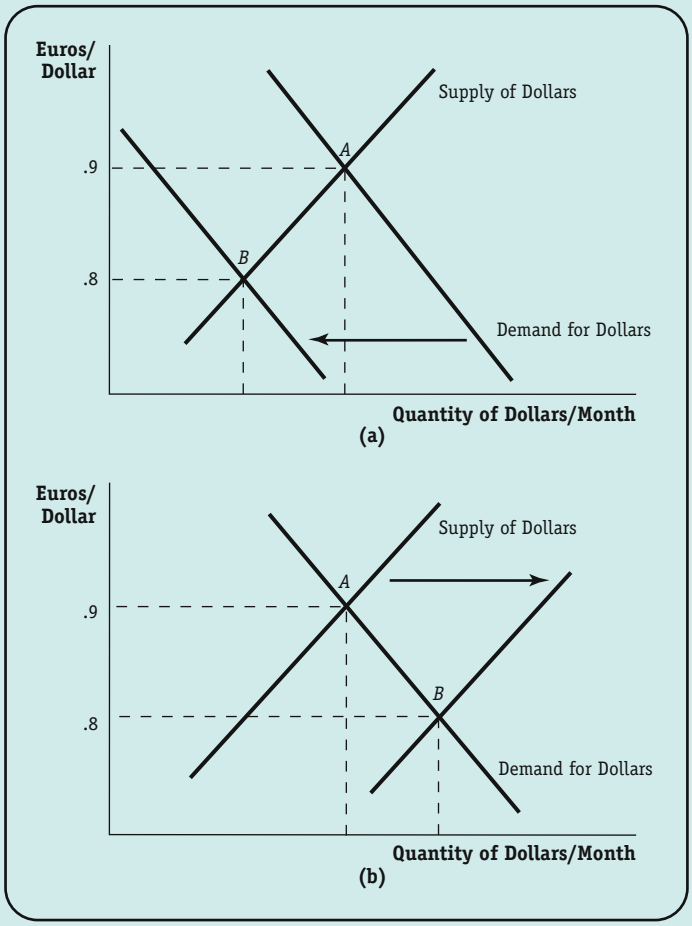
Managed Float Exchange Rate System
A system in which currency values fluctuate with changes in supply and demand but central banks may intervene if currency values are thought to be overvalued or undervalued.

Interestingly, central banks have intervened more often under the managed float than under the previous fixed exchange rate system, which required them to intervene to maintain the agreed-upon exchange rate. Sometimes central banks have intervened more frequently than at other times. Often, central banks of major countries have agreed to pursue similar exchange rate policies and have coordinated their interventions as part of the implementation of monetary policy. Central bank intervention is discussed more fully in Chapter 26.

One final point needs to be made. Under the managed float exchange rate system, many small countries peg the value of their currencies to the U.S. dollar or some other major currency or basket of currencies. By doing so, a small country reduces the risk that the value of its currency will fluctuate unpredictably. If the exchange rate of a small country fluctuates unpredictably, the value of real or financial assets denominated in that currency will also fluctuate unpredictably. By tying the value of its currency to the U.S. dollar or a basket of other major currencies, a small country can reduce this risk. A financial crisis can result, however, if the country cannot maintain the fixed exchange rate. Both the Mexican peso crisis of 1994 and the Asian crisis of 1997–1998 occurred when the affected countries were unable to maintain an exchange rate that they had fixed in terms of the dollar. In both cases, the eventual depreciation of the currencies triggered

The Foreign Exchange Market

In the accompanying graphs (a) and (b), the quantity of dollars is measured on the horizontal axis, and the exchange rate (euros per dollar) is measured on the vertical axis. The quantity supplied of dollars per month, reflecting U.S. demand for foreign goods, services, and securities, is, ceteris paribus, a positive function of the exchange rate, while the quantity demanded of dollars per month is a negative function of the exchange rate. In this case, quantity demanded is equal to quantity supplied at point *A*, producing an equilibrium exchange rate of .9 euros. Assume now that the initial equilibrium at point *A* in graph (a) is disturbed by one of the following developments: (1) the euro price of U.S. goods and services rises relative to the euro price of foreign goods and services because of inflation in the United States, (2) foreign interest rates rise relative to U.S. interest rates, or (3) foreign incomes fall relative to U.S. incomes. The result is a reduction in the demand for U.S. goods, services, and financial instruments by foreigners and thus a reduction in the demand for dollars—shown as a leftward shift of the demand function in graph (a).



The new equilibrium at point *B* results in a depreciation of the dollar from .9 euros to .8 euros.

Next, assume that the economy is again at the initial equilibrium exchange rate of $1=.9 euros as in graph (b). The equilibrium is disturbed by one of the following developments: (1) a rise in U.S. income, (2) a rise in U.S. prices relative to the dollar prices of foreign goods, or (3) a rise in foreign interest rates relative to U.S. interest rates. As a result, U.S. demand for foreign goods, services, and securities increases, as does the supply of dollars—shown as a rightward shift of the supply function in graph (b). The new equilibrium at point *B* results in a depreciation of the dollar as the equilibrium exchange rate falls from .9 euros to .8 euros.

In reality, a shock such as an increase in foreign interest rates relative to U.S. rates will shift the demand for dollars left (as foreigners want to invest less in dollar-denominated assets) and the supply of dollars right (as Americans will want to invest more in euro-denominated assets). Both shifts will cause the value of the dollar to fall. The relative magnitudes of the two shifts can be seen by the change in the volume of foreign exchange transactions. If the leftward shift in dollar demand is larger, exchange transactions will fall, but if the rightward shift in supply is larger, then the volume of foreign exchange transactions will increase.

widespread losses, the failure of many financial and nonfinancial firms, and financial crises. Exhibit 25-1 on p. 624 gives the exchange rate arrangements for most countries in the world.

Managing Exchange Rate Risk Under the Managed Float

Under flexible exchange rates, when market participants enter into contracts to receive or supply so much foreign currency on a future date, there is an exchange rate risk because the future spot exchange rate is unknown.[4] Market participants may be importers or exporters who will receive or who need a given amount of foreign exchange on a future date, or they may be investors who have purchased or who plan to purchase foreign financial securities that will mature in the future. If the exchange rate changes unexpectedly between now and the future date, the anticipated profits of an exporter, importer, or investor could be reduced. Worse yet, a loss could be incurred. Thus, under flexible exchange rate systems, market participants are exposed to substantial exchange rate risk.

In recent years, international financial markets have developed hybrid instruments including foreign exchange forward, futures, options, and swap agreements to hedge exchange rate risk. These instruments, which are all forms of derivatives, can be used to reduce the risk of unforeseen price changes. In this case, the prices are exchange rates. Thus, these markets can reduce exchange rate risk.

Forward, futures, options, and swap agreements effectively lock in today's exchange rate for a transaction that may or will occur in the future, thus reducing the risk that changes in the exchange rate will alter expected outcomes.

The development of foreign exchange forward, futures, options, and swap agreements coincides with the tremendous growth in trade and capital flows, coupled with the increased volatility of exchange rates under the managed float exchange rate system. Because these instruments can reduce exchange rate risks, they may facilitate trade in goods, services, and financial claims.

25-1
Exchange Rate Regimes as of 2007

1. Exchange arrangements with no separate legal tender, another country's currency as legal tender (10 countries)
Ecuador, El Salvador, Kiribati, Marshall Islands, Micronesia, Montenegro, Palau, Panama, San Marino, Timor-Leste

2. Currency board arrangements (13 countries)
Bosnia and Herzegovina, Brunei Darussalam, Bulgaria, Djibouti, Estonia, Hong Kong SAR, Lithuania
ECCU (6 countries): Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines

3. Other conventional fixed-peg arrangements (70 countries)
Against a single currency (49 countries)
Angola, Argentina, Aruba, Bahamas, Bahrain, Barbados, Belarus, Belize, Bhutan, Bolivia, Cape Verde, Comoros, Egypt, Eritrea, Ethiopia, Guyana, Honduras, Jordan, Kuwait, Latvia, Lebanon, Lesotho, Macedonia, Maldives, Malta, Mauritania, Mongolia, Namibia, Nepal, Netherlands Antilles, Nigeria, Oman, Pakistan, Qatar, Rwanda, Saudi Arabia, Solomon Islands, Suriname, Swaziland, Syria, Trinidad and Tobago, Turkmenistan, Ukraine, United Arab Emirates, Uzbekistan, Venezuela, Vietnam, Yemen, Zimbabwe
CFA franc zone (14 countries)
WAEMU
Benin, Burkina Faso, Côte D'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo
CEMAC
Cameroon, Central African Rep., Chad, Congo, Rep. of Equatorial Guinea, Gabon
Against a composite (7 countries)
Fiji, Libya, Morocco, Samoa, Vanuatu, Iran, Seychelles

4. Pegged exchange rates within horizontal bands (5 countries)
Within a cooperative arrangement
Cyprus, Denmark, Slovak Republic
Other band arrangements
Hungary, Tonga

5. Crawling peg (6 countries)
Azerbaijan, Botswana, China, Iraq, Nicaragua, Sierra Leone

6. Crawling bands (1 country)
Costa Rica

7. Managed floating with no predetermined path for the exchange rate (48 counties)
Afghanistan, Algeria, Armenia, Bangladesh, Burundi, Cambodia, Colombia, Croatia, Czech Rep., Dominican Rep., Gambia, Ghana, Georgia, Guatemala, Guinea, Haiti, Indonesia, India, Jamaica, Kazakhstan, Kenya, Kyrgyz Rep., Laos, Liberia, Madagascar, Malawi, Malaysia, Mauritius, Moldova, Mozambique, Myanmar, Papua New Guinea, Paraguay, Peru, Romania, Russia, São Tomé and Príncipe, Serbia, Singapore, Sri Lanka, Sudan, Tajikistan, Tanzania, Thailand, Tunisia, Uganda, Uruguay, Zambia

8. Independently floating (35 countries)
Albania, Australia, Brazil, Canada, Chile, Congo, Iceland, Israel, Japan, Korea, Mexico, New Zealand, Norway, Philippines, Poland, Slovenia, Somalia, South Africa, Sweden, Switzerland, Turkey, United Kingdom, United States
Euro Area (13 countries, as of April 2007)
Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Slovenia, Spain

Source: IMF Annual Report—2007, Appendix, Table 11–9.

The Path to a Single European Currency

In 1979, the European Monetary System was established to increase exchange rate stability among countries in Western Europe. Under the system, individual currencies had limited flexibility, and central banks intervened by buying and selling currencies if exchange rates moved outside a narrow band. If fundamental imbalances existed, exchange rates were changed to correct the imbalances. In that same year, the European Currency Unit (ECU) was created. The ECU was an accounting unit made up of a weighted basket of currencies. The weights were determined by the gross domestic product and other real and financial variables of the participating countries. It was hoped that the ECU would eventually lead to the creation of a single currency.

In the Maastricht Treaty of 1991, 15 European countries agreed to a plan to adopt a single European currency by no later than 1999.[a] During the phase-in period, the countries maintained exchange rates within a narrow range of the ECU.[b] As of January 1, 1999, 11 countries participated in the currency union. Exchange rates of the 11 participating countries were fixed and no longer fluctuated even within a narrow range. In addition, the newly established European Central Bank, together with the national central banks, formed the Eurosystem that took over the formulation of monetary policy. Although the new currency did not yet circulate, all newly issued stocks and government bonds, bank accounts, corporate books, credit card payments, and mortgages could be figured in euros.[c]

The euro began circulating on January 1, 2002. Europeans exchanged their own national currencies for euros. After March 1, 2002, the national currencies were no longer accepted as money within participating "eurozone" nations.

To participate in the single currency, countries had to meet certain criteria, including having annual budget deficits not greater than 3 percent of their GDP and a government debt less than 60 percent of GDP or moving toward that goal. Of the 15 countries that signed the Maastricht Treaty, Great Britain, Denmark, and Sweden decided not to participate in the currency union. Greece became the twelfth country to participate in the currency union when it was able to join in 2001. In 2006, Slovenia and Cyprus were admitted, and then in 2008, Slovenia joined the eurozone. By 2008, 15 member states with over 320 million people were in the eurozone.

In giving up their national currencies, participating countries have surrendered the right to determine their own national interest rates, exchange rates, and monetary policies. In addition, they have given up some control over the size of their budget deficits. For example, countries may not be able to run fiscal deficits as large as they would like or to lower interest rates as much as they would like in the face of unemployment, and they definitely will not be able to devalue national currencies!

Despite these potential disadvantages, the participating countries supported the common currency to reduce transactions costs associated with making exchanges and to support greater economic integration. It was hoped that such a reduction would translate to higher economic growth rates. In describing the creation of the euro, a *Business Week* magazine contributor stated: "The potential benefits are limitless—and so are the risks."[d]

Endnotes

a. The following countries signed the Maastricht Treaty: Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, and Sweden.
b. A currency crisis in 1992 caused the range to be widened from 2.5 percent to 15 percent.
c. Recall the discussion of the Eurosystem in Chapter 9.
d. "The Euro," *Business Week* (April 27, 1998): 90–94.

The Role of the Dollar Under the Managed Float

Under the Bretton Woods Accord, the dollar played a dominant role in the international financial system because it served as the official reserve currency. Under the managed float system, the dollar has continued to play an important role in the international financial system. Because of its relative stability, the dollar continues to serve as the major reserve currency.

In addition to serving as a reserve asset, the dollar is sometimes used as a medium of exchange and a unit of account in international markets. Exchanges between two currencies of small countries often take place through dollars rather than directly. For example, Peru might convert its currency to dollars and use the dollars to purchase the currency of South Africa rather than using its own currency to purchase the currency of South Africa directly. Prices of standardized contracts of raw materials and commodities are often quoted in dollars. For example, the price of oil from the Middle East is still typically quoted in dollars, and the dollar is also usually the medium of exchange through which oil is bought and sold around the world. The dollar is accepted for payments in many faraway places and has been widely used in countries experiencing political and economic unrest in the past, such as Russia, Ukraine, and Mexico.

The dollar also acts as a store of value. As you have seen, 50 to 60 percent of all U.S. currency and more than 70 percent of $100 bills are held abroad. The dollar is demanded as a store of value because of the political stability of the United States and the dollar's acceptance over time.

Although the dollar is no longer the official reserve asset, the demand for dollars to be used in international financial markets (either as reserves or for other uses) has continued to grow. Indeed, the demand for dollars has grown faster than domestic real incomes due to the increase in trade, capital flows, and real incomes around the world.

The importance of the dollar as a foreign exchange currency has fluctuated since the end of Bretton Woods, falling for two decades after 1973, increasing from 1993 to 2001, then again falling in recent years. While the British pound, Japanese yen, and Swiss franc all serve as reserve currencies, the biggest challenger to the dollar is the euro. Since its introduction in 1999, the euro's share in official foreign exchange reserves has increased from 17.9 to over 27 percent in March 2008. Over this same period, the pound's share has risen from 2.9 to 5 percent, the yen's share has fallen from 6.4 to 3 percent, and the dollar's share has fallen from 70.9 to about 63 percent.

Within this changing environment, several international organizations are developing unique roles in the international financial system. These organizations include the International Monetary Fund, the World Bank, and the Bank for International Settlements. They seek to foster stability in the international financial system so that the benefits of trade and cross-border trading of financial instruments can be realized.

Just as the financial system has evolved to deal with the growth in trade and capital flows, these organizations are redefining their roles in the increasingly globalized economy. It is to these organizations that we now turn.

Recap

Since 1973, major industrialized countries have participated in a managed float exchange rate system. The value of a currency is determined by supply and demand, but governments intervene by buying and selling (demanding and supplying) currencies to affect currency values. Small countries often tie the value of their currencies to the dollar or some other major currency. Foreign exchange forward, futures, options, and swap agreements have been developed to allow market participants to hedge exchange rate risks. Under the managed float, the dollar is still the major international reserve asset, although other currencies also serve as international reserves, and the euro has emerged as a serious competitor to the dollar. Both the euro and the dollar are demanded in international financial markets because of their perceived stability. They serve as a medium of exchange, a unit of account, and a store of value in some international markets.

MAJOR INTERNATIONAL FINANCIAL ORGANIZATIONS

As you have seen, the Bretton Woods Accord of 1944 established the fixed exchange rate system that remained in effect until the early 1970s. In addition, the meetings at Bretton Woods resulted in the creation of the **International Monetary Fund (IMF)** and the **World Bank.** Although the fixed rate exchange system has not survived, the IMF and World Bank did not meet a similar fate, as will be discussed in this chapter. Indeed, in recent years, both have gained in stature; another international organization, the Bank for International Settlements (BIS), is also discussed. The BIS predates the IMF and the World Bank and is the oldest major international financial institution in existence today.

International Monetary Fund (IMF)
An organization created in 1944 to oversee the monetary and exchange rate policies of its members, who pay quotas that are used to assist countries with temporary imbalances in their balance of payments.

World Bank
An investment bank created in 1944 that issues bonds to make long-term loans at low interest rates to poor countries for economic development projects.

The International Monetary Fund (IMF)

The purposes of the International Monetary Fund are:

> to promote international monetary cooperation . . . ; to facilitate the expansion and balanced growth of international trade . . . ; to promote exchange stability . . . ; to assist in the establishment of a multilateral system of payments . . . ; to make its general resources temporarily available to its members experiencing balance of payments difficulties under adequate safeguards . . . ; and to shorten the duration and lessen the degree of disequilibrium in the international balances of payments of members.[6]

As such, the IMF is a voluntary institution owned and directed by the countries that choose to join. The IMF is much like an overseer of the monetary and exchange rate policies of its members. Member countries agree to exchange their currencies freely with other foreign currencies, to keep the IMF informed of changes in financial and monetary policies that may affect other members, and to adjust these policies based on the recommendations of the IMF for the greater common good.

When joining the IMF, each country is assessed a quota (membership fee) based on its economic importance and the amount of its international trade. A country's voting rights in the organization are proportionate to the amount of its quota. At the IMF's inception, the total quota (subscription) was $8.8 billion, of which the U.S. share

was 31 percent. Thus, the United States controlled 31 percent of the votes. Quotas are revised every five years to ensure that the IMF has adequate funds at its disposal. As of February 2008, 185 countries (including all major countries of the world) were members of the IMF, and the total subscription was roughly $338 billion. The amount of the subscription has grown as more countries have joined the IMF and larger quotas have been assessed. Over the years, the U.S. share has fallen to 16.79 percent. Therefore, the United States today controls 16.79 percent of the votes. The IMF is headquartered in Washington, D.C., and has approximately 2,700 employees from more than 141 countries. Other offices are in Paris, Geneva, Switzerland, and at the United Nations in New York.

The IMF administers the pool of funds generated by the quotas to assist member countries that, because of deficits in their balance of payments, do not have enough foreign exchange to pay all of the claims that are being presented to them. Members can borrow from the pool of funds to resolve temporary imbalances. This influx of funds gives them time to change their economic policies so that balance of payment deficits are resolved in an orderly manner with minimal damages to themselves and to other countries. Members must request assistance and abide by IMF policy recommendations if receiving the funds. In addition to the pool of funds generated from the quotas, the IMF also has standby agreements to borrow supplemental funds, if needed, from the wealthiest members.

Special Drawing Rights (SDRs)
International reserve assets created by the IMF to supplement other international reserves.

In 1969, the IMF created **special drawing rights (SDRs),** which are international reserve assets that supplement other international reserves. SDRs were created in response to a shortage in international reserves. At that time, the Bretton Woods Accord was still in effect, and the dollar was the official reserve asset. The value of the SDR is a weighted average of the U.S. dollar, the euro, Japanese yen, and British pound sterling, so it fluctuates daily.

As of the end of January 2008, members held a total of 21.5 billion SDRs. Since each SDR was worth about 1.6 U.S. dollars, the outstanding dollar value of all SDR holdings was about $34 billion, representing about 1 percent of nongold international reserves of the member countries. SDRs are bookkeeping entries not backed by other reserve assets, and they provide the international financial system with additional liquidity. Central banks use SDRs, rather than other national currencies, to make payments to other member countries.

In the past, SDRs have been distributed to members of the IMF according to their quotas. Although only two distributions have been made since their inception, additional SDRs can be created and distributed if the IMF determines that there is a long-term global need for additional international reserves. The last distribution was in 1981. In September 1997, the IMF proposed an additional one-time allocation to spread the SDRs more equitably among members; such an allocation requires the approval of 85 percent of IMF voting power. Although 77.3 percent of IMF voting power did indeed approve it, the United States—which holds more than 17 percent of the power—opposed the distribution, so it has not taken place. Since the last allocation, 41 countries have joined the IMF and, hence, have never received an allocation.

The activities of the IMF can be divided into two distinct periods: the Bretton Woods era and the period since the managed float. During the Bretton Woods era, the IMF's activities centered on monitoring the fixed exchange rate system and assisting countries in maintaining it. The IMF would often make loans to countries to finance short-term deficits in their balance of payments so that the fixed exchange rates could be maintained. If long-term problems existed, the fixed exchange rates were adjusted to correct the imbalances. When making loans, the IMF often recommended that the recipient country change the domestic policies that had contributed to its balance of

payments deficit. As already noted, loans were contingent on the borrower's acceptance of the IMF's recommendations.

When fixed exchange rates were abandoned in 1973, the IMF no longer had a fixed rate system to monitor, so its role changed. Now the IMF, in an advisory capacity, oversees economic policies that affect the balance of payments and exchange rates. In addition, the IMF provides information to members about countries that are experiencing balance of payments difficulties that could result in financial crises. Finally, the IMF continues to provide financial assistance to members that experience short-term balance of payments problems. As before, the financial assistance is contingent on the recipient's promise to reform its economic policies and adopt the IMF's recommendations. The IMF played a key role in resolving the international debt crisis that afflicted less-developed countries in the 1980s, the Mexican peso crisis of 1994–1995, and the Asian crisis of the late 1990s. Intervention by the IMF has also prevented many financial crises from occurring. For a discussion of the IMF's role in the Asian crisis of the late 1990s, see the accompanying "A Closer Look" feature on p. 630.

In the 2000s, the growing economic integration of the world's goods, services, and capital markets has created new opportunities and challenges for the IMF. It is taking a leading role in defining and fostering a stable international financial system.

The World Bank

Like the IMF, the World Bank was created in 1944 at Bretton Woods, is headquartered in Washington, D.C., and has 185 member countries as of 2008. The similarities stop there, however. The World Bank is an investment bank that issues bonds and uses the proceeds to make long-term, low-interest-rate loans to poor countries for economic development projects. The bonds have the highest credit rating because the World Bank's 185 member countries guarantee repayment.

International Bank for Reconstruction and Development (IBRD)
A bank that makes 12- to 15-year loans to poor, but not the poorest, countries, charging an interest rate just above the rate at which the bank borrows.

International Development Association
An association that makes interest-free loans with a maturity of 35 to 40 years to the world's poorest countries.

The World Bank is really two organizations: the **International Bank for Reconstruction and Development (IBRD)** and the **International Development Association.** The latter makes interest-free loans with a maturity of 35 to 40 years to the world's poorest countries (in 2008 countries with a Gross National Income per capita below $1,065); about 50 percent of these loans go to African nations. The IBRD makes the bulk of its 12- to 15-year low-interest-rate loans to "middle income" countries with per capita incomes above $1,065 per year. However, as the World Bank points out, over 70 percent of the world's poor, those who live on less than $2 per day, live in these middle income countries. These countries may have private borrowing opportunities, but at much higher rates of interest. The interest rate charged is slightly above the rate the bank pays to borrow when it issues the bonds.

Many of the loans financed by the World Bank are used to build infrastructure: electric power plants, roads, and the like. The bank also finances projects to improve drinking water, waste disposal, health care, nutrition, family planning, education, and housing. In addition to loans, the bank provides technical assistance. Many countries that borrowed from the World Bank in the past have developed sufficiently and no longer need assistance. Thus, the bank can direct its aid to other poor countries.

International Finance Corporation
An organization that mobilizes funding for private enterprise projects in poor countries.

The World Bank focuses on public projects rather than directly assisting private enterprises in developing countries. Another organization, the **International Finance Corporation,** seeks to mobilize funding for private enterprises. Although legally separate from the World Bank, the corporation is associated with it and is the organization through which the World Bank encourages small business development. The International Finance Corporation has also helped to establish stock markets in many developing countries, thus increasing the ability to attract international capital flows.

The Role of the IMF in the Asian Crisis

The IMF was created at the end of World War II to assist countries that were experiencing a financial crisis. The goal was to contain the crisis and prevent it from spreading to the global financial system.[a] The IMF assists countries that are experiencing a financial crisis by providing large-scale liquidity. In addition, the IMF can provide technical assistance to help policy makers find a resolution to the crisis.

The Asian crisis of 1997 arose out of a situation in which the currencies of Southeast Asia were pegged to the dollar and, thus, had appreciated along with the dollar. Given large current account deficits and relatively small supplies of international reserves, the currencies became overvalued. In addition, the countries were enjoying significant capital inflows and had large short-term loans denominated in U.S. dollars. If the currencies were devalued, more domestic currency would be required to pay back the dollar-denominated loans. The result would be many defaults and bankruptcies.

Throughout the crisis, the IMF played a significant role in helping the countries of Southeast Asia find a solution to their problems. Beginning in late 1997, the IMF recommended that the overvalued currencies be devalued. After the initial round of devaluations and the breaking of the dollar peg, the IMF called for the Asian nations to substantially increase their interest rates in an attempt to stop the continuing slide of currency values. In addition, the IMF made short-term loans to provide liquidity to the stricken economies. The goals of the rescue plans were to stabilize currency values, restore investor confidence, and reestablish the nations' access to international capital flows.

The IMF assistance did not come without strings attached. The IMF required the countries to pursue contractionary fiscal policies designed to cut consumption. The fall in consumption would lead to a decrease in imports and a reduction in the current account deficits. This policy recommendation was fairly typical for the IMF in such a situation.

In addition, the IMF required the governments to introduce structural changes into their financial systems, in particular, to improve the regulation and oversight of their banks. In the future, the countries were also to avoid becoming so dependent on short-term financing (especially from abroad) to prevent their financial systems from being so vulnerable to changes in market sentiment.

By mid-1998, some economies in Southeast Asia were on the road to recovery, although they were far from experiencing healthy growth. Without loans from the IMF, the crisis would have persisted. It is also highly likely that the countries would have defaulted on their short-term U.S. dollar loans.

Although the IMF had some success in alleviating the crisis, its policies have been criticized. Some critics complain that the rescue plans did not go far enough because they did not entail a restructuring of the short-term debt and left corporate sectors in a very fragile financial position. Without such a restructuring, the currencies continued to depreciate, and bankruptcies persisted longer than had a restructuring plan been part of the rescue package. At the other extreme, some critics argue that the crisis would have had a greater long-term, positive impact if it had been

allowed to run its course without intervention from the IMF, although the short-term pain would have been greater. Still other critics argue that the crisis could have been prevented or at least mitigated if the IMF had warned the international financial community earlier about the problems of the troubled economies. [b]

Overall, the Asian crisis has caused the IMF to reconsider its role as an international financial organization, particularly as it relates to imposing structural reforms on its members and to fostering a stable international financial system.

The crisis also spawned the creation of the Financial Stability Forum to promote global financial stability.

Endnotes

a. A major rationale for intervening in financial crises was that an international financial crisis could lead to a military conflict. World leaders were painfully aware of the contribution of Germany's problems with hyperinflation in the 1920s to the rise of Hitler and subsequent world war.
b. Others believe that early warning systems may cause some crises to occur that otherwise would not.

The Bank for International Settlements (BIS)

Bank for International Settlements (BIS)
An international financial organization that promotes international cooperation among central banks and provides facilities for international financial operations.

The **Bank for International Settlements (BIS)** is an independent international financial organization, headquartered in Basel, Switzerland, that was created in 1930, which was 14 years before the Bretton Woods Accord. As such, it is the world's oldest international financial organization. The purpose of the BIS was "to promote the cooperation of central banks and to provide additional facilities for international financial operations."[7] The BIS was originally established to monitor and administer the reparations that the countries defeated in World War I were required to pay to the victorious nations. In addition, the BIS was to provide specialized services to central banks and, through them, to the international financial system.

Since 1960, the BIS has become an important international monetary organization with expanding functions. The BIS acts as a trustee for many international financial agreements and monitors compliance with the agreements. It is very active in identifying, negotiating, and monitoring international standards for banking regulation and supervision. The BIS seeks to establish international reporting standards for financial institutions and to assist countries in developing safe and sound financial practices. It encourages cooperation among member and nonmember central banks.

At the present time, 55 countries are members of the BIS, and the bank's directors come from the central banks of 13 countries (Belgium, Canada, China, France, Germany, Italy, Japan, Mexico, the Netherlands, Sweden, Switzerland, the United Kingdom, and the United States) and the European Central Bank. Central bankers from Belgium, France, Germany, Italy, the United Kingdom, and the United States are permanent members of the board of directors. A country does not have to be a member of the BIS to have an account with the bank, and central banks of 130 countries have deposit accounts with the BIS totaling around 6 percent of world foreign exchange reserves as of September 2007. The bank has 550 employees from 50 countries.

In addition to acting as a bank for central banks, the BIS is a meeting place where central bankers consult on a monthly basis. Since the early 1960s, a group of 11 nations (Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland,

the United Kingdom, and the United States), widely known as the *G-10*, has held regular monthly meetings at the bank to discuss international financial matters including financial stability. As financial markets have become more globalized, these informal meetings have taken on more importance and led to greater international cooperation. In Chapter 17, we discussed the details of the Basel Accord of 1988 that established international standards for banking regulation among the 12 nations that signed the agreement. The agreement was negotiated at the BIS.

At the present time, the BIS is expanding its relationships with central banks in emerging economies and, thus, is increasing its stature in the international financial system.

A FRAMEWORK FOR INTERNATIONAL FINANCIAL STABILITY

Leaders from Canada, Germany, France, Italy, Japan, the United Kingdom, and the United States (known as the *G-7 countries*), have met annually since 1975 to discuss common concerns, including the international financial system. Discussions before and after meetings are sometimes broadened to include leaders from other countries, including but not limited to the leaders of the G-10 countries mentioned earlier, who also meet annually. The financial crisis in Asia of the late 1990s revealed several deficiencies in the international financial system. As a result, the G-7 nations created the **Financial Stability Forum (FSF)** in early 1999 to promote international financial stability through the exchange of information and to foster cooperation in financial supervision and surveillance. The Financial Stability Forum consists of representatives of central banks, Treasury departments, and international financial institutions.

Financial Stability Forum (FSF)
An organization of representatives of central banks, Treasury departments, and international financial institutions created in 1999 to promote international financial stability through the exchange of information and to foster cooperation in international financial supervision and surveillance.

The FSF currently has 26 representatives from 12 countries, as well as 15 additional members from international organizations such as the World Bank and the IMF. Serviced by a small secretariat at the BIS in Basel, Switzerland, the FSF sponsors regularly scheduled meetings and occasionally special meetings centered on specific issues such as financial reporting and auditing.

In February 2008, the FSF's Working Group on Market and Institutional Resilience sent its recommendations to the G7 finance ministers and Central Bank governors concerning matters such as: international supervision and oversight, the originate to distribute model of asset-backed securities, the uses and role of credit ratings, market transparency, regulatory response to changes in risks, and regulatory authorities' ability to respond to crises.

The G-7 leaders agree that as a prerequisite for participating in a stable international financial system, a country must have sound economic policies that foster noninflationary growth. Emerging countries that want to take advantage of increased international capital flows need support and encouragement to develop stable financial systems and markets that are appropriately supervised both internally and externally. Developing countries must establish banking systems that encourage the appropriate amount of risk taking. The system may include deposit insurance and a lender of last resort, but it should still allow private lenders to bear the costs of their decisions as well as to reap the rewards. If lenders know that national or international regulators will bail them out in the case of failure, they are likely to engage in too much risk taking. The case in which lenders are encouraged to take too many risks because they know they will be bailed out is an example of the moral hazard problem confronting institutions.

At the same time, the financial system should be strong enough that private failures rarely spill over to the entire financial system.

In addition to establishing healthy national financial systems, countries must also standardize the reporting of qualitative and quantitative information about their

financial markets, institutions, laws, and regulations. Reporting of fiscal conditions should include information about international reserves, external debt (both short and long term), and the health of the banking sector. At the same time, financial and nonfinancial institutions should adopt international accounting standards that allow for effective international comparisons. International standards should be developed for auditing, disclosure, bankruptcy, corporate governance, and the valuation of stocks, bonds, and other assets.

Finally, organizations such as the IMF and BIS should work with the Financial Stability Forum to see that the international financial system is more transparent and that surveillance is more open.

Recap

The IMF, the World Bank, and the BIS all have unique roles in the international financial system. The IMF promotes exchange rate stability, oversees the international financial system, and lends to member countries experiencing temporary balance of payments deficits. The World Bank promotes the economic development of the world's poorest countries by raising funds to make development loans. The BIS acts as a bank for central banks and seeks to establish and monitor international reporting and capital standards for financial institutions and to assist countries in developing safe and sound financial practices. The FSF, consisting of representatives of central banks, monetary authorities, and international financial institutions, meets regularly to exchange information and foster cooperation in financial surveillance and supervision in order to promote global financial stability.

Summary of Major Points

1. The international financial system consists of the arrangements, rules, customs, instruments, facilities, and organizations that enable international payments to be made and funds to flow across borders. The international financial system has experienced tremendous growth in recent years because of the increase in trade in goods, services, and financial instruments; technological advances; and the removal of barriers to capital flows. The system is composed of the international money and capital markets and the foreign exchange market.
2. The Bretton Woods Accord of 1944 established fixed exchange rates between the U.S. dollar and other major currencies. Under the accord, foreign countries defined their currencies in terms of the U.S. dollar and agreed to buy or sell dollars, the official reserve asset, to maintain the agreed-upon exchange rates. The dollar, in turn, was defined in terms of gold, and the United States agreed to convert any unwanted dollars of foreign central banks into gold.
3. Under fixed exchange rates, if a country other than the United States had a deficit in its balance of payments on current and capital accounts, it used supplies of dollars to purchase its own currency and maintain the exchange value. Likewise, if such a country had a surplus in its balance of payments on current and capital accounts, it demanded dollars to maintain or support the value of its currency. Persistent deficits and surpluses caused foreign countries to devalue or revalue their currencies, respectively.
4. The United States was in the unique position of being able to run persistent deficits in its balance of payments on current and capital accounts while foreign central banks were accumulating dollars to serve as international reserves. Once foreign central banks had acquired sufficient reserves, the ability of the United States to run deficits in its balance of payments on current and capital accounts was also limited. Eventually, the United States was unable to continue to convert dollars into gold, and

the Bretton Woods system of fixed exchange rates collapsed in 1973. It was replaced by a system of flexible exchange rates. During the Bretton Woods period, trade in goods, services, and financial instruments was much lower than it is today.

5. Under flexible exchange rates, the value of the dollar is determined by the demand for and supply of dollars, and the exchange rate will gravitate to the value at which quantity demanded is equal to quantity supplied. The demand for dollars is determined by foreign demand for U.S. goods, services, and financial instruments. The supply of dollars is determined by U.S. demand for foreign goods, services, and financial instruments. Ultimately, the demand for and supply of dollars are determined by domestic and foreign incomes, inflation rates, and interest rates.
6. Since 1973, the major industrialized countries have participated in a managed float exchange rate system. Under a managed float, market forces determine exchange rates, but governments may intervene by demanding or supplying currencies to affect exchange rates. Smaller countries often tie the value of their currencies to the dollar or some other major currency.
7. The dollar is very important in the international financial system because it serves as the major international reserve asset. Other currencies that serve as international reserves include the Japanese yen, the British pound, and especially the euro, which is emerging as a serious competitor to the dollar. In addition, dollars are demanded in international financial markets to serve as a medium of exchange, a unit of account, and a store of value. Even though the dollar is no longer the official reserve currency, the international demand for dollars has increased because of the growth of trade in goods, services, and capital flows.
8. Foreign exchange forward, futures, options, and swap markets are used by market participants to hedge exchange rate risk. They effectively allow those who will need or will receive foreign exchange in the future to lock in an exchange rate today.
9. The IMF is an international organization owned and operated by its 185 member countries. It promotes exchange rate stability, oversees the international financial system, and lends to member countries experiencing temporary balance of payments deficits. In addition to quotas from its members, the IMF has lines of credit from the major industrial countries to lend, if needed, to member countries with balance of payments difficulties. SDRs are an international reserve asset created by the IMF to supplement the supply of international reserves.
10. The World Bank promotes the economic development of the world's poorest countries by raising funds to make development loans. A total of 185 countries belong to the World Bank. Whereas the World Bank funds public projects, the International Finance Corporation seeks to encourage private enterprise and development. The corporation is separate from the World Bank but works closely with it.
11. The BIS acts as a bank for central banks and seeks to establish and monitor international reporting and capital standards for financial institutions and to assist countries in developing safe and sound financial practices. The Financial Stability Forum, created after the Asian financial crisis, consists of representatives from central banks, Treasury departments, and international financial institutions. It meets regularly to establish and maintain a framework for international financial stability.

Key Terms

Bank for International Settlements (BIS), p. **631**
Bretton Woods Accord, p. **617**
Devalue, p. **618**
Financial Stability Forum (FSF), p. **632**
Fixed Exchange Rate System, p. **617**
Floating (Flexible) Exchange Rate System, p. **621**
International Bank for Reconstruction and Development (IBRD), p. **629**
International Development Association, p. **629**
International Finance Corporation, p. **629**
International Financial System, p. **616**

International Monetary Fund (IMF), p. **627**
Managed Float Exchange Rate System, p. **621**
Official Reserve Account, p. **617**
Official Reserve Currency, p. **617**
Revalue, p. **619**
Special Drawing Rights (SDRs), p. **628**
World Bank, p. **627**

Review Questions

1. What is the international financial system, and how has it changed in recent years? What opportunities does the new system offer? What are the challenges?
2. Identify and explain three differences between the international monetary system under the Bretton Woods Accord and the managed float exchange rate system that replaced it.
3. Why did the Bretton Woods Accord break down?
4. What was the role of the dollar under the Bretton Woods Accord?
5. Why has the demand for dollars in international financial markets continued to grow, even though the dollar is no longer the official reserve currency?
6. When a country ran a deficit in its balance of payments under the Bretton Woods Accord, how was that deficit resolved?
7. Leticia is a small country that is experiencing a deficit in its balance of payments. The value of Leticia's currency is tied to the U.S. dollar, which has been appreciating. What options could the IMF recommend to correct the imbalance in Leticia's balance of payments?
8. Under flexible exchange rates, what happens if a country experiences a deficit in its balance of payments? How long can a deficit in the balance of payments persist?
9. Why and how do central banks intervene in foreign exchange markets under the managed float exchange rate system?
10. How do the roles of the IMF and the BIS differ? How are they similar? What is the primary function of the World Bank?
11. What is the difference between the types of projects financed by the World Bank and those funded by the International Finance Corporation?
12. What factors have contributed to the increase in capital flows among countries?
13. What is the contagion effect? Why is it more pronounced today than it was 30 years ago?
14. What were the causes of the Asian crisis? What did the IMF do to mitigate the Asian crisis?
15. Explain how foreign exchange futures contracts can be used to reduce exchange rate risk. Is there exchange rate risk under both fixed and flexible exchange rate systems? Explain.
16. Use Exhibit 25-1 to define *pegged exchange rates*, *currency board*, and *exchange agreements with no separate legal tender*. How many countries have currency boards?
17. What is the Financial Stability Forum? Why was it created?

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

✓19. Suppose the United States has capital inflows of $100 billion and capital outflows of $200 billion. What is the balance on the capital account?

✓20. Go online and find today's yen/dollar exchange rate. Has the dollar appreciated or depreciated since March 5, 2008, when $1 equaled 104.03 yen?

✓21. Graphically demonstrate what would happen to the exchange rate in each of the following situations:
   a. The U.S. trade deficit increases, ceteris paribus.
   b. The U.S. trade deficit decreases, ceteris paribus.
   c. Capital outflows increase, ceteris paribus.
   d. Capital inflows increase, ceteris paribus.

Suggested Readings

Visit the sites of the World Bank, the International Monetary Fund, and the Bank for International Settlements at **http://www.worldbank.org, http://www.imf.org**, and **http://www.bis.org/index.htm**.

More information about the Financial Stability Forum can be found at **http://www.fsforum.org/home/home.html.**

Stanley Fischer, who served as deputy director of the IMF during the Asian crisis, gives an insightful look at many of the issues discussed in this chapter in *IMF: Essays from a Time of Crisis—The International Financial System, Stabilization, and Development* (Cambridge, MA: MIT Press, 2004).

For a book that looks at the somewhat controversial history of the Bank for International Settlements, see James C. Baker, *The Bank for International Settlements: Evolution and Evaluation* (Westport, CT: Quorum Books, 2002).

For a comprehensive and detailed look at some issues pertaining to global policy making, see Claudio Borio and William R. White, "Whither Monetary and Financial Stability: The Implications of Evolving Policy Regimes," *Monetary Policy and Uncertainty: Adapting to a Changing Economy*, BIS Working Paper, No. 147, Federal Reserve Bank of Kansas City (February 2004): 131–211. The paper is also available online at **http://ssrn.com/abstract=901387**.

"Identifying the Role of Moral Hazard in International Financial Markets" is the subject of a paper by the same name by Steven B. Kamin, International Finance Discussion Papers, Board of Governors of the Federal Reserve, 2002–736 (September 2002). It is available online at **http://www.federalreserve.gov/pubs/ifdp/2002/736/default.htm.**

An article that looks at the role of the U.S. dollar in the global financial system is Stephan Schulmeister's "Globalization Without Global Money: The Double Role of the Dollar as National Currency and World Currency," *Journal of Post Keynesian Economics 22*, no. 3 (Spring 2000): 365–396.

For a discussion of "The IMF and Global Financial Crises" see Joseph Joyce's article by the same name in *Challenge* 43, no. 4 (July–August 2000): 88–107. For another interesting article, also in *Challenge*, see Jane D'Arista's "Reforming International Financial Architecture," 43, no. 3 (May–June 2000): 44–82.

For a blending of theory and application to the changing international financial system, see Hans Visser, *A Guide to International Monetary Economics*, 2nd ed. (Northampton, MA: Edward Elgar, 2000).

For an in-depth look at the Asian crisis, see Uri Dadush, Dipak Dasgupta, and Marc Uzan, eds., *Private Capital Flows in the Age of Globalization: The Aftermath of the Asian Crisis* (Northampton, MA: Edward Elgar, 2000).

For a pessimistic view about the global financial system, see James L. Clayton, *The Global Debt Bomb* (Armonk, NY: M.E. Sharpe, 1999).

For a comprehensive article on the IMF, see Jane Sneddon Little and Giovanni P. Olivei, "Rethinking the International Monetary System: An Overview," *New England Economic Review*, Federal Reserve Bank of Boston (November 1999): 3–24.

Endnotes

1. Remarks by Alan Greenspan before the 34th Annual Conference on Bank Structure and Competition at the Federal Reserve Bank of Chicago, May 7, 1998.
2. In this chapter, when we refer to *dollar* or *dollars*, we also mean *dollar-denominated deposits.*
3. Recall from Chapter 8 that the *current account* measures transactions that involve currently produced goods and services (exports and imports) and net transfer payments. The *capital account* measures the financial flows of funds and securities among countries.
4. We hope you recall that the spot exchange rate is the exchange rate of foreign currency for immediate delivery.
5. *Annual Report of the Executive Board for the Financial Year Ended April 30, 2004* (Washington, DC: International Monetary Fund): 102.
6. See the home page of the IMF at **http://www.imf.org**.
7. From article 3 of the original statute creating the Bank for International Settlements.

CHAPTER TWENTY-SIX 26

If countries don't discipline themselves, the world market will do it.

—Morris Offit, Offitbank

Monetary Policy in a Globalized Financial System

Learning Objectives

After reading this chapter, you should know:

How international trade and capital flows affect monetary policy in a globalized financial system

The limitations of domestic monetary policy under fixed and flexible exchange rate systems

Why monetary policy will most likely require increased global coordination in the future, regardless of the exchange rate system

MONETARY POLICY AND THE GLOBALIZATION OF FINANCE

We have seen that one of the most important roles of the Fed is to formulate and implement the nation's monetary policy. The Fed attempts to ensure that sufficient money and credit are available to allow for a stable and healthy financial system. In this way, the economy can expand in accord with its long-run growth potential with little or no inflation and with minimal fluctuations in output and employment.

We have also seen that financial markets have experienced ongoing and dramatic changes. The financial system is experiencing a dramatic metamorphosis, driven by technological improvements in computers and telecommunications, the breakdown of barriers to capital flows, and an increasingly globalized environment. As a result, the international financial system has experienced inordinate growth, and economies have become much more interdependent in just a few short years. Never has the interdependencies of the world economies been more clear than in the ongoing financial crisis of 2008–2009. What began in U.S. mortgage markets spread around the globe as "toxic" mortgage-backed securities that were sold into global markets, threatening financial institutions around the world and causing a global recession that left policy makers scrambling to fix the broken economy.

In this final chapter, we look at the policy implications of the continuing growth of international trade and the globalization of the financial system. We consider the effects of monetary policy under both fixed and flexible exchange rate systems. You shall see that the globalization of finance may, of necessity, change the modus operandi of the Fed even though the goals of monetary policy remain the same. In this financial crisis, major central banks of the world have consulted with each other on a continuous basis and acted to provide liquidity to global markets to an unprecedented extent. In October 2008, major central banks also announced a coordinated interest rate cut in what may be the beginning of a new era of global monetary policy coordination.

MONETARY POLICY UNDER FIXED EXCHANGE RATES FROM 1944 TO 1973

Bretton Woods Accord
The 1944 accord that established a fixed exchange rate system among major industrialized countries, making the U.S. dollar the official reserve asset.

Fixed Exchange Rate System
System in effect when countries agree to buy or sell their currency to maintain fixed exchange rates with other currencies.

Official Reserve Asset
The asset (such as the dollar or gold) by which other countries define the value of their currency; used as international reserves.

As you saw in Chapter 25, from 1944 until 1973, the major economies of the world participated in the **Bretton Woods Accord,** a **fixed exchange rate system** with the U.S. dollar serving as the **official reserve asset.** Other countries defined their currencies in terms of the dollar and bought or sold dollars to maintain the fixed exchange rates. Supporters of the Bretton Woods Accord believed that the fixed exchange rate system offered several advantages.

One advantage was that under some conditions, inflation and unemployment could be self-correcting. If inflation or unemployment accelerated in one country relative to the rest of the world, market forces in international markets would come into play and cause the inflation and unemployment to be reduced.

Under a fixed exchange rate system, when a country experienced inflation higher than that of its trading partners, its balance of payments would go into a deficit position as net exports fell and capital outflows increased. Net exports would fall because the country's domestic prices were relatively higher than prices in the rest of the world, leading to a decrease in exports and an increase in imports. If the inflation were due to increases in the money supply, lower interest rates initially could also lead to a net capital outflow as foreign financial securities became more attractive than domestic securities. The net capital outflow would further increase the deficit in the balance of payments. Under the Bretton Woods Accord, the inflation-ridden country would be forced to buy back its currency to maintain fixed exchange rates. The act of buying back its currency

tended to reduce the country's domestic money supply and inflationary pressures, increase domestic interest rates, and improve the trade imbalance. Thus, inflation would be self-correcting.

Likewise, if unemployment in a country increased, income would fall, causing imports to decrease and, assuming that exports remained constant, net exports to increase. The balance of payments would move into a surplus position, and the country would experience an increase in international reserves. If policy makers allowed the increase in international reserves to also increase the domestic money supply, the level of economic activity would speed up and employment would increase. Note that if the increase in international reserves did not lead to expansion of the domestic money supply, employment would not rise.

Exchange Rate Risk
The risk that changes in the exchange rate can adversely affect the value of foreign exchange or foreign financial instruments.

Another advantage of a fixed exchange rate system was that it minimized **exchange rate risk.** This is the risk that changes in the exchange rate might cause the value of foreign currencies or foreign financial instruments to fall. Under a fixed rate system, such as the Bretton Woods Accord, currency values did not change under normal circumstances. Therefore, exchange rate risk was very small and related only to the probability that the monetary authorities would redefine the currency in terms of the official reserve asset. Ceteris paribus, lower exchange rate risk is an advantage because it leads to increases in trade, capital flows, and economic efficiency. As you saw in Chapters 8 and 22, derivatives can be used to hedge exchange rate risk. Under a fixed exchange rate system, there is less need for derivatives because exchange rate risk is lower than under flexible exchange rates. Because derivatives involve some fees, the transactions costs of exchanging currencies are also reduced.

Despite these advantages, the Bretton Woods system also entailed some disadvantages. The ability of foreign countries to pursue their own monetary policies was limited because each country had to support its currency if market forces caused the currency's value to deviate from the agreed-upon exchange rate. For example, when a country wanted to pursue a more expansionary policy, its monetary authorities would increase the supply of reserves available to the banking system. Interest rates would fall and the monetary and credit aggregates would increase. This policy might result in a deficit in the balance of payments on current and capital accounts for two reasons. First, an increase in domestic income causes imports to increase. If the expansionary policy also causes domestic prices to increase, then exports decrease at the same time. Thus, net exports (exports minus imports) would decrease due to the rise in domestic income. Second, because of the falling interest rates, the country would also experience a capital outflow that would further contribute to the deficit in the balance of payments on current and capital accounts.

The central bank of the deficit country would then have to use its supplies of dollars to purchase its own currency to maintain the agreed-upon exchange rate. The act of buying back its currency would at least partially undo the stimulatory effects of the injection of reserves and would limit the monetary authorities' ability to pursue an expansionary policy. If the country ran out of dollars, it might have to devalue its currency.

Devaluation
Under fixed exchange rates, a reduction in the value of a currency by the monetary authorities relative to the official reserve asset.

Devaluation entails discreet changes in the official exchange rate by the central bank but can destabilize financial markets and the domestic economy.

Likewise, if a country wished to pursue contractionary policies relative to those of the rest of the world, its balance of payments on current and capital accounts would move toward a surplus position. Net exports would increase as imports fell relative to exports. If prices also fell due to the contractionary policies, exports would increase. The higher interest rate would also lead to a capital inflow. Both factors would put upward pressure on the exchange rate. The ability of the monetary authorities to limit the growth of the money supply would be reduced by the necessity to supply the country's

currency to maintain fixed exchange rates. The supplying of the currency would at least partially undo the contractionary effects. After a time, if the trade surplus and capital inflow persisted, the country would be under pressure to revalue its currency. In a **revaluation,** the monetary authorities increase the value of a currency relative to the official reserve asset. Again, financial markets and the economy would be destabilized. Although a country that is running a balance of payments deficit and losing international reserves must at some point devalue, the situation is different for a balance of payments surplus. If a country is running chronic surpluses, it does not have to revalue. Because a country can always print more money, the country could keep supplying its own currency, although this is a highly unlikely scenario.

Revaluation
Under fixed exchange rates, an increase in the value of a currency by the monetary authorities relative to the official reserve asset.

As we noted earlier, under normal circumstances, exchange rate risk is lower with fixed exchange rates. When the situation is not normal, however, this advantage can turn into a major disadvantage. If a country is running a deficit in the balance of payments and devaluation seems likely, market participants will attempt to supply more of the currency to the central bank in exchange for dollars, the official reserve asset. By supplying more of the currency, however, market participants will further deplete the country's international reserves. Devaluation, which may have been only a possibility, would become a necessity. Thus, the expectation of devaluation may become a self-fulfilling prophecy.

For example, suppose that market participants expect the value of the peso to fall from \$1 = 3.5 pesos to \$1 = 7 pesos. Before the devaluation, an investor could exchange 350 pesos for \$100 at the exchange rate of \$1 = 3.5 pesos. If the investor is correct and the peso is devalued, the \$100 will net 700 pesos after the devaluation. Note that the investor starts with 350 pesos and ends up with 700 pesos! As savvy investors exchange pesos for dollars, the country loses more of its international reserves, and the need to devalue becomes more imminent. In an attempt to stop the outflow of international reserves, policy makers may make the situation worse by denying that devaluation is a possibility. In this manner, the situation goes from bad to worse as devaluation is postponed until the problem becomes critical.

Another disadvantage of the Bretton Woods system was that it could be maintained only if all countries were willing and able to support their currencies and, if necessary, to periodically and orderly revalue or devalue them. As you have seen, foreign central banks had to adjust their currencies in terms of the dollar because the dollar was the official reserve asset. As long as foreign central banks were accumulating dollars to serve as international reserves, the United States could pursue expansionary domestic policies that resulted in balance of payment deficits on current and capital accounts. There was no need to worry about exchange rate pressures on its own or foreign currencies. Once foreign countries had acquired sufficient reserves, persistent U.S. deficits on current and capital accounts would result in the need for foreign countries to revalue their currencies. By the same token, persistent U.S. current and capital accounts surpluses would result in the need for foreign countries to devalue.

The need to periodically revalue or devalue was also related to the divergent domestic monetary and fiscal policies pursued by the Bretton Woods countries. Over time, if different countries pursued different policies, some countries would expand relatively faster than others, leading to exchange rate imbalances. For example, expansionary fiscal or monetary policy could cause one country to grow faster than another. Likewise, contractionary fiscal and monetary policy could cause a country to grow at a slower rate.

To the extent that countries experienced different growth rates, inflation rates, and interest rate structures, imbalances in the current and capital accounts would persist. If a country had more expansionary policies than the United States, it would experi-

ence chronic deficits in the current and capital accounts as well as the need to devalue. If a country had more contractionary policies, it would experience persistent surpluses and the need to revalue. If countries refused to make the necessary changes in their exchange rates, the system of fixed exchange rates established at Bretton Woods would break down.

As you saw in Chapter 25, the system did eventually break down when it became clear that the United States would not be able to continue to redeem dollars in gold. The breakdown occurred because U.S. policy makers were pursuing more expansionary policies than were some foreign economies, notably Germany and Japan. The result was an outflow of gold from the United States. With the suspension of the international conversion of dollars to gold in late 1971 and the official establishment of flexible exchange rates in 1974, the Bretton Woods fixed exchange rate system came to an end.

Recap

The Bretton Woods Accord of 1944 established fixed exchange rates among major world currencies with the U.S. dollar serving as the official reserve asset. Supporters of the system believed that inflation and unemployment would, under some circumstances, be self-correcting and that exchange rate risk would be reduced. The need to maintain fixed exchange rates limited the ability of a country to pursue its own monetary policy. If a country wished to pursue more expansionary policies, lower domestic interest rates and higher income could lead to a deficit in the balance of payments. The need to buy back one's own currency would thwart the expansionary policies.

MONETARY POLICY UNDER FLEXIBLE EXCHANGE RATES SINCE 1974

Flexible Exchange Rate System
An exchange rate system in which the value of a currency is determined by supply and demand.

Under a **flexible exchange rate system,** market forces determine the value of a nation's currency. For the U.S. dollar, this means that the exchange rate is determined by the demand for and supply of dollars in international markets. The supply of dollars/month reflects U.S. demand for foreign goods, services, and securities. Ceteris paribus, quantity supplied is a positive function of the exchange rate. The demand for dollars reflects foreign demand for U.S. goods, services, and securities. Ceteris paribus, quantity demanded is a negative function of the exchange rate. The market, if left alone, will gravitate to the exchange rate where quantity demanded is equal to quantity supplied. As you saw in Chapters 8 and 25, factors such as domestic and foreign income, inflation rates, and interest rates affect exchange rates, and "flexible" exchange rates immediately adjust to changing market conditions and expectations.

With the enactment of a flexible exchange rate system in late 1974, countries in some ways gained more control over their own monetary policies. No longer would a monetary objective or policy be compromised by a country's need to maintain the agreed-upon exchange rate as it was under the Bretton Woods Accord. No longer would a country have to support its domestic currency if market forces were causing the currency to depreciate or appreciate. As discussed in Chapter 8, **depreciation** occurs when the value of a currency falls in terms of another currency under a flexible exchange rate system. **Appreciation** occurs when the value of a currency rises in terms of another currency.

Depreciation
A decrease in the value of a currency in terms of another currency under a flexible exchange rate system.

Appreciation
A rise in the value of a currency in terms of another currency under a flexible exchange rate system.

If monetary policy makers in a country are pursuing more expansionary policies than those of their neighbors, the balance of trade can move into a deficit position, with resulting deterioration in the balance of payments. Likewise, if a more contractionary policy is pursued, the balance of payments can move into a surplus position. Even though the country no longer has to defend its currency to maintain fixed exchange rates, it must consider other international ramifications of its monetary policy. Perhaps the most

Dollarization and Currency Boards

Full Dollarization
Abandonment of a country's own currency to adopt another country's currency as its official currency.

Full dollarization occurs when a country abandons its own currency in order to adopt another country's currency as its official currency. The adopted currency becomes the medium of exchange and unit of account. The U.S. dollar is the currency that has been most widely adopted and used by other countries. Although the U.S. dollar is the most widely dollarized currency, the term *dollarization* is generic and, in many cases, has little to do with the United States or the U.S. dollar. For example, Greenland has adopted the Danish krone; Vatican City, the Italian lira; Tuvalu, the Australian dollar; and so on.

Since 1999, El Salvador, Ecuador, and Guatemala have dollarized by adopting the U.S. dollar and abolishing their domestic currencies. Argentina has seriously considered full dollarization. (Panama dollarized in the early twentieth century.) Full dollarization with the U.S. dollar is discussed as a way to help developing countries, particularly those in South and Latin America, to overcome monetary and exchange rate volatility and to stabilize prices.

There are both benefits and costs to full dollarization. On the benefits side, there can be no balance of payment crises or speculative attacks on the domestic currency if the currency does not exist. The increased stability should lead to increased capital inflows, lower interest rates, and greater investment and growth. Lower interest rates also reduce the government's cost of financing the public debt. Another possibility is increased trade and financial integration with the United States and reduced inflationary expectations.

The costs of full dollarization include the loss of the identity associated with one's national currency. Many of the European countries that participate in the euro had a difficult time giving up their domestic currencies. Seigniorage is a more direct cost.

Seigniorage
The difference between the cost of producing and distributing currency and any revenues earned.

Seigniorage is the difference between the cost of producing and distributing currency and any revenues earned through the distribution. For example, the Fed issues currency by purchasing government securities that earn interest. The interest goes to the Fed and eventually to the government. On the other hand, the currency issued by the Fed does not pay interest. The amount of interest earned on the government securities less the cost of producing the Federal Reserve notes is seigniorage. If a country fully dollarizes with U.S. dollars, that country forgoes earning seigniorage and the United States earns additional seigniorage that is related to the amount of U.S. dollars circulating in the foreign country. If electronic payments reduce the use of currency in the future, the amount of seigniorage will be reduced.

Another cost of full dollarization is that the country that dollarizes loses the ability to pursue an autonomous monetary policy. Small countries that wish to become more integrated with larger economies to increase trade and attract capital inflows have limited ability to pursue an independent monetary policy anyway.

Currency Board
An organized body within a country with the sole responsibility and power to define the value of the country's currency.

A close alternative to full dollarization is the creation of a currency board. A **currency board** is an organized body within a country with the sole responsibility and power to defend the value of a country's currency. The currency board pegs or fixes the currency value to the value of the currency of the dominant trading partner. The

country commits to a fixed exchange rate, and the currency is fully convertible with the pegged currency. The government cannot print money unless it is backed by reserves of the currency to which it is pegged. Finally, the currency board has the power to force the government to eliminate a budget deficit that may be inflationary.

A currency board can achieve many of the benefits of full dollarization. Also, the value of the seigniorage from issuing one's own currency is not lost. The problem is that the currency board may not be perceived to be as permanent as full dollarization. Given the perception that the currency board could be abolished or modified, the full benefits of increased trade and investment and lower interest rates would not be realized. The currency could still be subject to speculative attacks if speculators sold the currency at the preset price, putting tremendous pressure on the currency board to devalue. In 1991, Argentina established a currency board that fixed the Argentina peso with the U.S. dollar and experienced a severe financial crisis in early 2002. Despite the presence of the currency board, there is less certainty with a currency board than with full dollarization. The increased uncertainty leads to higher interest rates, lower investment, and slower growth than would likely occur otherwise. Argentina, Bulgaria, Bosnia, and Hong Kong have had successful currency boards.

Finally, it should be noted that dollars already circulate and are widely used in many of the countries that could benefit from full dollarization. To the extent that the dollar displaces the national currency, seigniorage is already reduced.

important effects are capital flows and the potential depreciation or appreciation of its currency. Depreciation and appreciation, in turn, can feed back to the domestic economy and cause changes in the growth rate of income through net exports.

If international trade and capital flows are small relative to the aggregate level of economic activity, monetary authorities may have greater latitude in the execution of policy. International trade and capital flows have increased significantly since 1970, however, so policy makers must consider how their policies will affect foreign countries and what the feedback to the domestic economy will be. For example, in 2007, U.S. exports were about $1,600 billion, while imports were roughly $2,300 billion in an economy where gross domestic product (GDP) was about $13,800 billion. In 1960, exports were roughly $25.3 billion and imports $22.8 billion, while gross national product (GNP) was $526.6 billion. Thus, in 1960, exports and imports were 4.8 and 4.3 percent of GNP, respectively ($25.3/$526.6 and $22.8/$526.6). By 2007, exports had grown to 11.6 percent of GDP ($1,600/$13,800), and imports had increased even more to 16.7 percent of GDP ($2,300/$13,800). In some ways, U.S. monetary authorities have always recognized that their monetary policies can affect interest rate, inflation, and growth in other countries. In recent decades, U.S. policy makers have also become increasingly aware that foreign events can at times influence the U.S. economy and, hence, the formulation and effects of policy.

Coincidentally, with the growth in trade in the 1970s, governments began to remove barriers to international capital flows. The dismantling was virtually complete by the 1980s. In addition, major breakthroughs in telecommunications technologies and the electronic transfer of funds now allow funds to be transferred almost instantaneously anywhere in the world. These two factors have created a worldwide foreign exchange market where the buying and selling of different currencies take place and the "wheels are greased" for international trade and capital flows among nations. In 2007,

the foreign exchange market traded more than $3.2 trillion every day—the equivalent of nearly $500 per day per person in the world—making it the largest market in the world. Because enormous sums of funds flow with lightning speed, the ability for funds to find their highest return is greatly increased. From an economic standpoint, economic efficiency is enhanced when funds flow to the location with the highest risk-adjusted return.

Capital flows jeopardize or weaken the intended effects of monetary policy. To illustrate, we will consider the case of contractionary monetary policy, in which the Fed raises interest rates to slow the level of economic activity. If U.S. interest rates move up relative to interest rates abroad, ceteris paribus, foreigners will demand more U.S. financial instruments—which will then pay a relatively higher return—and less of their own financial instruments—which will then pay a relatively lower return. The demand for dollars increases and puts upward pressure on the exchange rate. Capital flows in from abroad as the dollar appreciates. The augmented supply of funds from abroad causes U.S. interest rates, although higher than before the Fed acted, to be lower than they otherwise would be. Thus, slowing the level of economic activity is more difficult because of the offsetting effect of capital flows on the supply of loanable funds.

In addition, because of the reduced demand for foreign financial instruments, ceteris paribus, there is also a tendency for prices of foreign financial instruments to fall and foreign interest rates to rise. Changes in the supply of and demand for financial instruments cause capital flows that will bring real interest rates between countries into closer alignment. Given a change in U.S. interest rates, freer capital movements will bring about immediate changes in the exchange rate and eventual interest rate adjustments in foreign economies.

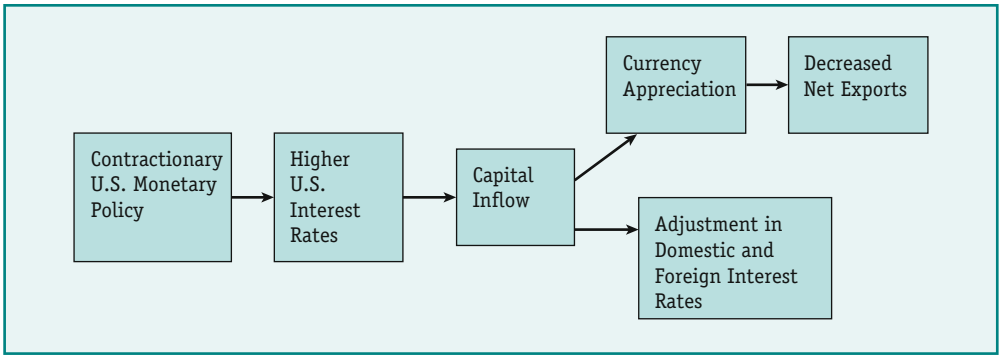
Continuing with our example of contractionary U.S. policy, if the increase in the domestic interest rate causes the dollar to appreciate, the dollar price of foreign goods falls while the foreign price of U.S. goods rises. The result is a decrease in exports and an increase in imports. Thus, net exports will also fall in response to an appreciation of the exchange rate. This latter effect reinforces the contractionary effects of a rise in domestic interest rates.

At the same time that these forces are working to decrease net exports, two other effects are working in the opposite direction—to increase net exports. First, the increase in domestic interest rates could cause a reduction in domestic demand as the demand for interest-sensitive expenditures falls. The reduction in aggregate demand decreases the demand for imports, thereby increasing net exports from what they otherwise would be. Second, if the slowing of the economy causes domestic prices to fall relative to foreign prices, then, ceteris paribus, both foreign and domestic customers have an incentive to switch to domestically produced goods and services. These two effects work to increase net exports and to mitigate the decline in net exports that results from the appreciation of the dollar.

Nevertheless, in most cases, the decrease in net exports caused by the appreciation of the dollar will be larger than the increase in net exports resulting from these two additional factors. Hence, the total effect of contractionary monetary policy is to decrease net exports. Although that may not always be the case, we usually assume that higher U.S. interest rates lead to an appreciation of the domestic currency, capital inflows, a decrease in net exports, and a larger trade deficit (or smaller trade surplus). Exhibit 26-1 provides a schematic diagram of the results of U.S. contractionary monetary policy under flexible exchange rates.

The impact of U.S. monetary policy also depends on the monetary and fiscal policies of other countries. If other central banks attempt to slow their economies when the U.S. monetary authorities are doing so, resulting effects on exchange rates depend on

26-1
A Schematic View of the Results of U.S. Contractionary Policy Under Flexible Exchange Rates



the relative magnitudes of the interest rate changes among the various countries. Thus, we can conclude that interest rates and exchange rates are determined jointly by the monetary and fiscal policies of the various interdependent countries and the resulting market forces.

In summary, the growth of trade and capital flows has occurred in a world that switched from fixed to flexible exchange rates. Because central banks are no longer necessarily committed to maintaining the value of their respective currencies, policy makers have more independence in formulating and executing monetary policy. A country's ability to run a monetary policy far different from that of its neighbors is limited by the increased interdependence of economies and the ease with which capital flows across borders. Capital flows and changes in the exchange rate offset the effects. The more important trade is to the domestic economy and the greater the ease with which capital flows between nations, the larger the effects. Thus, for the United States, external factors are likely to dampen the effects of any Fed actions that result in relative interest rate or income changes. In the near term, an increase in U.S. rates relative to foreign rates usually increases the exchange rate of the dollar and capital inflows, ceteris paribus. Similarly, a decrease in U.S. rates relative to foreign rates usually leads to decreases in the exchange rate of the dollar and capital outflows, ceteris paribus. Note that as a result of capital flows, these financial adjustments to U.S. monetary policy action will occur in advance of the slower response of output and prices.

Thus, the crux of the dilemma is that under fixed exchange rates, countries are limited in running their own monetary policies because of the need to maintain the value of their currency. Under flexible exchange rates, countries can also be limited. If a country tries to run a policy that is different from the rest of the world, capital and real flows will occur and will complicate the results and jeopardize that policy. What does all of this mean for the future? In a nutshell, it means that in all probability, nations will have to be more concerned about coordinating their monetary policies. The next section looks at the specifics.

Recap

Under flexible exchange rates, the value of a currency is determined by supply and demand. Flexible exchange rates free a country from the need to supply or demand dollars to maintain fixed exchange rates. In this way, flexible exchange rates allow policy makers more freedom in pursuing policies that diverge from those of other countries. At the same time, however, policy makers must also be concerned about the effects of their domestic policies on exchange rates and capital flows. Under flexible exchange rates, a country can pursue its own policy, but if it differs from policies in the rest of the world, changes in net exports and capital flows can mitigate the intended effects of the policy.

Capital Flows and the Mexican Peso Crisis

The Mexican peso devaluation of late 1994 is a striking example of the implications of international capital flows and how quickly they can occur. The story begins in the early 1990s, when large amounts of international financial capital poured into Mexico. Given its proximity and ties to the United States and the proposed North American Free Trade Agreement, Mexico appeared to be a safe haven. The market value of stocks traded on the Mexican stock exchange increased from $4 billion in 1985 to over $200 billion in 1993. In 1993, it was estimated that foreigners owned around 75 percent of the stocks traded on the exchange.[a] But the bubble could not last forever.

In the second half of 1994, Mexico began to experience capital outflows that resulted in a dramatic loss of international reserves, particularly the dollar. By December 20, 1994, Mexico found it necessary to devalue the peso by 15 percent from 3.50 to 4.00 pesos per dollar. Despite this move, the loss of international reserves continued, and three days later, when this exchange rate could not be maintained, the peso was allowed to float freely. The result was a 50 percent depreciation of the peso, massive capital outflows from Mexico, falling stock prices, skyrocketing interest rates, and an international financial crisis.

The capital outflow caused Mexico to lose most of its international reserves. Reserves fell from $17.1 billion on November 1, 1994, to $3.8 billion by January 30, 1995. There were fears that the government would default on the Tesobonos, which were dollar-indexed government bonds issued in pesos with maturities up to a year. Foreign investors, many of whom were in the United States, held half of the Tesobonos. President Bill Clinton authorized a $20 billion rescue package that would enable Mexico to redeem all maturing Tesobonos with U.S. dollars. (An additional rescue package later arranged by Clinton amounted to $30 billion.) As a result of the crisis, Mexico experienced a severe recession.

In addition to political instability in Mexico, many analysts believe that the crisis was caused by two international events. The first was the reversal of Japanese capital flows into Mexico in response to the domestic crisis in Japan. The second was the rise in U.S. interest rates orchestrated by the Fed starting in early 1994. Both caused capital flows out of Mexico and contributed to the subsequent crisis. Writing in *The Columbia Journal of World Business,* Michael Adler made three observations about the crisis:

1. Markets are extremely sensitive to uninsured risks and react quickly and massively when risks are perceived to rise.
2. Any rush to sell in one sector of the market produces liquidity shortages that cause selling pressures to cascade into other market sectors. [As a result of the Mexican peso crisis, other emerging markets and even other developed economies also experienced international capital outflows.]
3. Markets need some kind of insurance when governments, by suddenly changing the interest rate environment as the Federal Reserve did . . . can confront investors with the risk of ruin.[b]

As we noted in this chapter and in Chapter 25, the potential for crisis is augmented because capital flows are larger and more volatile than in the past.

Endnotes

a. Tom Petruno, "Global Money—Free Flows, Free Falls," *The Los Angeles Times* (March 19, 1995): A11.
b. Michael Adler, "Mexico's Devaluation: The Beginning, Not the End, of Its Problems," *The Columbia Journal of World Business* (Spring 1995): 112–120.

THE GLOBALIZATION OF MONETARY POLICY

A new reality is having a profound influence on the conduct and effectiveness of domestic policies. Simply put, the economies of the world are becoming more interdependent. What goes on in Tokyo, London, Hong Kong, Paris, and Buenos Aires has an increasingly important effect on the financial system and the economy in the United States. Consequently, U.S. policy makers have somewhat less control over the performance of the U.S. economy than in previous eras, when the American economy was more isolated from international trade and finance. As Alan Greenspan said about the effects of the ongoing crises in Russia and Asia on the U.S. economy: "It is just not credible that the United States can remain an oasis of prosperity unaffected by a world that is experiencing greatly increased stress."[1]

Such observations have given rise to calls for cooperation and coordination among world policy makers. Although the difficulties some countries have in coordinating their domestic monetary and fiscal policies suggest that coordinating policies across countries will never be easy, the existence of globalization does highlight the new challenges and complexities facing policy makers.

As you first saw in Chapter 25, policy makers are attempting to meet the challenges of globalization through informal discussions among the major industrialized countries and through international organizations such as the International Monetary Fund and the Bank for International Settlements. The dialogues suggest that to achieve a stable international financial system, countries around the world must have healthy financial systems with noninflationary policies. In addition, countries must standardize the reporting of information about financial markets, institutions, laws, regulations, international reserves, external debt (both short and long term), and the health of the banking sector. Finally, the surveillance of international organizations that oversee the international financial system must be more transparent and open. In such an environment, the full benefits of globalization could be reached while minimizing the costs.

When considering the future, one must consider a wide range of possibilities. In the broadest sense, major world economies will either remain on a version of the present system of flexible exchange rates or return to a version of fixed exchange rates. In either case, the ramifications for monetary policy will be considerable.

A fixed exchange rate system can be sustained only if the growth and inflation rates of the participating countries are similar and only if devaluations and revaluations occur in an orderly manner. To maintain the system for any period of time, both the monetary policies and the fiscal policies of the participating countries must be coordinated. As you have seen, divergent monetary and fiscal policies will lead to different growth rates of income, different inflation rates, and different interest rate structures. If economies grow at different rates, changes in net exports and interest rates will cause exchange rate pressures.

Looking Out

The Eurosystem

One of the best examples of increased cooperation and coordination in the formulation of monetary policy is the Eurosystem. As you saw in Chapter 9, the Eurosystem consists of the European Central Bank and the central banks of the 15 countries (as of 2008) that participate in the euro, Europe's single currency. As such, the Eurosystem implements and carries out monetary policies for the eurozone, with the primary goal of achieving price stability. To do this, the Eurosystem decides on a quantitative definition of price stability, such as 2 percent inflation or less.

In addition, "two pillars" are used to achieve the goal. The first pillar is a quantitative reference value for the growth rate of a broad-based monetary aggregate, such as *M*2 in the United States. The second pillar consists of a broad collection of indicators that policy makers use to assess the outlook for price developments in the area as a whole. The former is similar to targeting a monetary aggregate to guide policy formulation. The latter is similar to using a more eclectic approach in policy formulation.

To achieve its goals, the Eurosystem uses tools similar to the Fed's, including open market operations, a lending facility like the discount window called a *standing facility,* and reserve requirements. The 15 national central banks hold the required reserves, carry out open market operations, and operate the standing facility. The Eurosystem must approve of the financial instruments that are allowed to be used in open market operations. The system also sets reserve requirements and interest rates on standing facility loans. In addition, it takes actions that nudge interest rates and the monetary aggregates in one direction or the other as part of monetary policy.

The current chairman of the European Central Bank (ECB) is Jean-Claude Trichet. In early 2008, he had an opportunity to prove that the ECB's primary goal is price stability. In the wake of several large rate cuts by the U.S. Federal Reserve, the ECB has held its rates steady, and as theory would predict, the euro has increased dramatically versus the U.S. dollar. When asked why he was not lowering interest rates in the face of the financial sector difficulties, Mr. Trichet stated: "There is no contradiction between price stability and financial stability."[a]

Endnote

a. Dougherty, Carter. "In Europe, Central Banking Is Different." *The New York Times,* March 6, 2008.

If the participants' monetary and fiscal policies are similar, however, it is possible for them to reap large benefits from the increased trade and integration that fixed exchange rates could encourage. Increased trade would allow the countries to enjoy a higher standard of living, and capital flows would allow surplus funds to flow to their highest return. The downside is twofold: Countries that value their independence or have divergent goals with respect to unemployment and inflation would not do well under a fixed exchange rate system. In addition, countries may not have the political discipline to stick with fixed exchange rates if domestic problems become paramount.

Under flexible exchange rates, capital flows limit a country's ability to execute policies that deviate significantly from those of the rest of the world. Thus, incentive exists for nations to cooperate to find a workable policy acceptable to all. There is already a great deal of monetary policy coordination among developed countries. Some coordination is spearheaded by international organizations such as the International Monetary Fund, which was created at the Bretton Woods Conference, and the Bank for International Settlements in Basel, Switzerland. Informal groups of major trading partners meet regularly to discuss policy regimes and options and often communicate and work together to coordinate policies. One group, called the G-7 nations, includes the United States, the United Kingdom, France, Germany, Japan, Canada, and Italy. In a "managed" flexible exchange rate system, exchange rates are determined by the forces of supply and demand, with occasional central bank intervention. The central banks of the G-7 nations have frequently intervened by buying and selling in currency markets to affect exchange rates since 1971.[2]

On occasion, the U.S. Treasury and the Fed intervene in the foreign exchange market to restore orderly conditions or to influence exchange rates. Since the mid-1980s, they have pursued intervention, coordinated with the governments and central banks of the other G-7 countries, on several occasions. Given the large volume of foreign currency transactions, intervention by the central bank to directly affect exchange rates would have to be on a very large scale, even for a central bank. Therefore, intervention affects the market primarily by influencing market sentiment, although on occasion several central banks will try to directly affect exchange rates through coordinated intervention.

An example of coordinated intervention occurred in 1985, when leaders of France, Germany, Japan, Great Britain, and the United States met and decided to intervene in foreign exchange markets to reduce the value of the dollar. At that time, U.S. interest rates were high relative to those in the rest of the world, causing large capital inflows and a strong dollar. The strong dollar fueled trade deficits that were having a negative impact on U.S. employment. The plan was named the *Plaza Accord* after the hotel where the meeting took place. Since then, these nations and others have met on a more or less regular basis in an attempt to coordinate economic policy and to open international markets.

Two later examples of coordinated intervention occurred in mid-1998 and mid-2000. The first involved intervention by the United States and Japan to boost the value of the Japanese yen. On June 17, 1998, the Fed bought about $2 billion worth of yen in the first intervention on behalf of the yen in six years. At that time, the value of the yen had been declining for three years, and the exchange rate was near an eight-year low. On June 16, 1998, the yen/dollar exchange rate was $1 = 142 yen. After the intervention on June 17, 1998, the yen appreciated to $1 = 137 yen. There were two major reasons for the intervention. First, the sagging yen put additional pressures on the struggling economies of Southeast Asia, which needed to sell their goods to Japan. The weak yen made goods from Southeast Asia more expensive in Japan. Second, there was fear that the weak yen would pressure China to devalue its currency. A Chinese devaluation could set off another round of devaluations and defaults throughout Southeast Asia, intensifying the Asian crisis just as the stricken economies were beginning to recover. A unique aspect of this episode is that China had asked the United States and Japan to intervene. While the intervention appeared to impact exchange rates in the very short run, this was not true for the long run, and by late August of 1998, the yen was trading at $1 = 145 yen. Later that year, in the fall of 1998, the value of the yen in terms of the dollar did fall dramatically; however, the fall was not directly related to the intervention in June 1998.

The second example involved intervention by the G-7 major industrialized nations, including the United States, to boost the value of the euro. As noted in the body of the text, the G-7 nations include Canada, Germany, France, Italy, Japan, the United Kingdom, and the United States. The euro was launched on January 1, 1999, at a debut price of $1.17 against the dollar. By September 2000, the euro had fallen more than 28 percent to $.8439 against the dollar. Many analysts felt the euro was significantly undervalued but feared that a speculative attack on the new currency would drive its value down even further. On September 22, 2000, the G-7 nations initiated a concerted intervention by buying euros in currency markets. The initial result was an increase in the value of the euro to more than $0.88 against the dollar. However, the increase was short-lived. Within two weeks, the euro began a downward slide and by late October was trading at its all-time low. Several reasons were posited for the failure of the intervention. First, the European Central Bank followed the intervention with only a small increase in interest rates, and some felt that larger interest rate increases were necessary to support the currency. Second, with presidential elections in the United States in early November 2000, U.S. Treasury officials reiterated on several occasions that there was no change in the U.S. position on the strong dollar. Finally, others felt there were imbalances in the euro zone economies that would require structural changes in labor markets and tax laws before the euro would appreciate.

When central banks and governments decide to intervene in foreign exchange markets, they do so for three reasons:

1. To resolve a severe but temporary liquidity crisis and to stabilize international financial markets
2. To signal that regulators believe exchange rates are deviating significantly from fundamental underlying values (that is, the dollar is overvalued or undervalued because of speculation in the market)
3. To signal a change in exchange rate policy or to clarify an existing policy

When the Fed participates in an intervention, it does so by purchasing or selling dollars for other foreign currencies. Because the dollars go through the banking system, reserves are either augmented or decreased. They are augmented when the Fed buys foreign currencies with dollars. Reserves are decreased when the Fed buys dollars with foreign currencies that it has previously accumulated.

To limit the effects on reserves, the Fed can engage in *sterilization.* In this process, the full amount of the foreign exchange operation is offset by an open market operation so that the monetary base is unaffected by the foreign exchange operation. For example, suppose that the Fed in conjunction with Japan decides that the dollar is overvalued and the yen is undervalued. To prop up the value of the yen, the Fed sells dollars to purchase yen. If the transaction is unsterilized, the monetary base increases, and the domestic money supply and interest rates are affected. If the transaction is sterilized, the Fed uses open market sales to offset the increase in the monetary base. In general, in the United States, foreign exchange transactions are sterilized.

It is difficult to predict how the Fed will execute monetary policy in the future. Its current intermediate targets may no longer be relevant or effectively related to the level of economic activity in a globalized financial system. Within this system, the Fed must increasingly consider domestic exchange rates, capital flows, and foreign policies. Although the Fed's function will remain the same, it may have to work with new procedures and regulations, some of which will be international in scope.

Mutual interdependence is an unalterable fact in modern monetary policy. In the past, the Fed has responded to limit the damage of foreign financial shocks. In the future, it will also need to help ensure that U.S.-based shocks, such as the "mortgage

A New Kind of Monetary Policy Coordination

In the decades surrounding the euro's creation, the primary goal of monetary policy coordination was to limit exchange rate fluctuations. If a country's central bank pursued a relatively expansionary policy, increasing its money supply and reducing interest rates, then this country's currency would depreciate. For a group of integrated nations, such fluctuations were to be avoided for several reasons: i) The prospect of gains by successfully timing exchange rate changes could lead to destabilizing capital inflows and outflows. ii) Such fluctuations could lead to sudden changes in the direction of international trade and unnecessarily high adjustment costs in affected industries. A country which previously had a comparative advantage in one industry might suddenly find itself an importer of this product as a result of a sudden and unanticipated currency appreciation. iii) Most important for the countries that planned to adopt the euro, such fluctuations would complicate the transition to a single currency.

In more recent years, a new type of monetary policy coordination has become increasingly important—the maintenance of liquidity of internationally traded financial assets. Starting in late 2007 and continuing into 2008, representatives of the Fed have met with their counterparts from many central banks in order to maintain the liquidity of U.S. real estate–backed financial securities.[a] Foreign financial firms have been large investors in such securities, so any financial difficulties that might require them to rapidly liquidate their assets could significantly depress prices. With prices of such assets reduced to levels considered abnormally low, only investors in distress (or with a different assessment of the true long-term price of such securities) would consider selling. The prospect of falling asset prices, intertwined with reduced liquidity, could potentially cause a financial crisis that would seamlessly transcend national borders. Central banks are currently coordinating their efforts to maintain liquidity and forestall such a scenario. By the end of September 2008, the Fed had negotiated currency and asset swap agreements with the European Central Bank, the Bank of England, the Bank of Canada, the Bank of Japan, the Swiss National Bank, the National Bank of Denmark, the Bank of Norway, the Reserve Bank of Australia, and the Bank of Sweden, totaling a whopping $620 billion. In late October 2008, the Fed announced additional swap agreements with the central banks of Singapore, Mexico, Brazil, and South Korea. Such agreements represent attempts to maintain liquidity in global financial markets and to enhance the smooth functioning of the global financial system. Many large central banks also announced a coordinated interest rate cut that same month.

Interestingly, as central banks have become more involved with maintaining liquidity for specific asset classes, they have become less involved with maintaining stable exchange rates. To be sure, recent increases in the value of the euro and the concomitant decreases in the dollar have brought requests from those adversely impacted to halt and even reverse the trend, but unlike such episodes in the past, there seems little attempt to harmonize the monetary policies pursued by the ECB and the Fed.

Finally, as we saw in Chapter 10, the Fed also coordinated interest rate decreases with the European Central Bank and those in Canada, England, and Sweden immediately following the terrorist attack on September 11, 2001. The Fed also arranged

currency swap agreements with the European Central Bank, the Bank of England, and the Bank of Canada, totaling $68 billion to aid foreign banks in countries whose U.S. operations were disrupted by the attack.

Endnote

a. Federal Reserve Press Release, May 2, 2008.

meltdown," don't adversely impact foreign financial markets in a way that could ultimately boomerang back to the United States in an amplified or more virulent form. The Fed will have to design policies for a world with increasing trade and minimal barriers to international capital flows that can occur with great speed.

In conclusion, we can say that whether the world returns to fixed exchange rates or maintains the current flexible exchange rate regime, some policy coordination will be needed. Although flexible exchange rates increase the potential independence of monetary policy, the increasing openness of world trade and finance has heightened the interdependencies among nations. Flexible exchange rates allow a central bank to set its interest rates somewhat independently of other countries, but capital mobility means that a change in the interest rates relative to other countries is compensated for by changes in exchange rates and capital flows. Thus, a central bank's freedom to set interest rates is only as great as its acceptance of the foreign exchange rate movements and the capital flows connected with a change in interest rates. Amid all of the uncertainties, one factor seems highly probable: Monetary policy in the future will most likely involve more global coordination and cooperation whether it be under fixed or flexible exchange rates.

Recap In the future, countries will be required to coordinate their monetary policies whether exchange rates are fixed or flexible, as countries become more interdependent due to the growth of trade and capital flows. In the past, cooperation between central banks was centered on exchange rate stability. Recently, such cooperation has been employed to maintain liquidity of specific classes of internationally traded securities such as those backed by U.S. real estate loans.

Summary of Major Points

1. The Bretton Woods Accord of 1944 established fixed exchange rates between the U.S. dollar and other major currencies. Supporters of the fixed exchange rate system believed that under some circumstances, inflation and unemployment would be self-correcting.
2. The need to maintain the value of the currency under fixed exchange rates limited the ability of a country to pursue its own monetary policy independent of other participants in the agreement.
3. Because countries had divergent monetary and fiscal policies, exchange rate imbalances persisted. Eventually, the United States was unable to maintain the conversion of dollars into gold, and the Bretton Woods system of fixed exchange rates collapsed in 1971. It was replaced by a system of flexible exchange rates.
4. Under flexible exchange rates, the value of the dollar is determined by the demand and supply of dollars. Flexible exchange rates freed countries from

the need to support their currencies to maintain fixed exchange rates. Each country in some ways gained greater latitude in adjusting its domestic monetary policy.

5. Even though countries do not have to support their currencies under flexible exchange rates, they must be aware of the effects that their monetary and fiscal policies have on the exchange rate, capital flows, and net exports. Monetary policy must be executed with an understanding of the international ramifications and the feedbacks to the domestic economy. This is particularly true if net exports are a relatively large component of aggregate demand and if capital flows are unrestricted.
6. Trade has increased because of the concerted efforts of developed nations since World War II. These efforts result from the recognition of the gains from trade to all trading partners. Capital flows have also increased because of the removal of capital barriers and because of technological advances that have increased the speed of such flows.
7. Under flexible exchange rates, there is an incentive for countries to work together to coordinate monetary policy. Indeed, there is already considerable monetary policy coordination, particularly among such groups as the G-7 countries. Regardless of whether exchange rates are fixed or flexible, monetary policy in the future will most likely entail increased global coordination as economies become more interdependent because of the growth in trade and capital flows.

Key Terms

Appreciation, p. **641**
Bretton Woods Accord, p. **638**
Currency Board, p. **642**
Depreciation, p. **641**
Devaluation, p. **639**
Exchange Rate Risk, p. **639**
Fixed Exchange Rate System, p. **638**
Flexible Exchange Rate System, p. **641**
Full Dollarization, p. **642**
Official Reserve Asset, p. **638**
Revaluation, p. **640**
Seigniorage, p. **642**

Review Questions

1. Briefly explain the Bretton Woods exchange rate system. When was it created? When and why did the system collapse?
2. Under the Bretton Woods system, the U.S. dollar was the official reserve asset. How did this affect the U.S. balance of payments on current and capital accounts? Could the United States experience large balance of payments deficits on current and capital accounts indefinitely?
3. Assume that you work at the central bank of a small country that is considering an expansionary monetary policy to speed up the level of economic activity. Given fixed exchange rates, advise the president of your country what will happen to net exports if the country pursues a policy of monetary expansion. What action will the central bank have to take to support the agreed-upon exchange rate? How will that action affect the expansionary policy?
4. Argue that fixed exchange rates are preferable to flexible exchange rates. Then present the opposite argument.
5. For each of the following situations, assuming fixed exchange rates, tell what will happen to the balance of payments on current and capital accounts in the United States, ceteris paribus:
   a. Domestic income increases.
   b. Domestic interest rates fall.
   c. Foreign income increases.
   d. Foreign interest rates fall.
   e. Domestic inflation increases.
   f. Foreign inflation increases.
6. For each of the situations in question 5, tell what will happen to the exchange rate, assuming flexible exchange rates.
7. Explain whether you agree or disagree with the following statement: Flexible exchange rates allow nations to pursue their own monetary policies.

8. What are the advantages of fixed exchange rates? What are the disadvantages? Does it matter if the country is large or small?
9. Briefly explain how interest rates on instruments of comparable risk and maturity will tend to be equalized in a world without capital barriers.
10. Under a flexible exchange rate system, what effect does contractionary monetary policy have on the exchange rate?
11. Why is a country limited in executing its own monetary policy under a fixed exchange rate system? How is it limited under a flexible exchange rate system?
12. How can monetary policy coordination among countries increase the degree to which monetary policy can be used to pursue macroeconomic goals under fixed exchange rates? Under flexible exchange rates?
13. Could high U.S. interest rates affect investment spending in foreign countries? Explain.
14. What is the Eurosystem? Briefly discuss how the Eurosystem conducts monetary policy.
15. What is full dollarization? How does it differ from a currency board? What is seigniorage?

Analytical Questions

Questions marked with a check mark (✓) are objective in nature. They can be completed with a short answer or number.

✓16. Use graphs to demonstrate what will happen to the value of the dollar in terms of the Japanese yen in each of the following situations:
   a. U.S. income increases.
   b. Japanese income increases.
   c. U.S. interest rates fall.
   d. Japanese interest rates fall.
   e. U.S. inflation increases.
   f. Japanese inflation increases.

✓17. If the nominal U.S. interest rate is 10 percent and U.S. inflation is 6 percent, what is the real U.S. interest rate? What is the real U.S. rate in terms of foreign interest rates?

✓18. The Fed exchanges $1 million for 139 million yen. If the Fed sells $1 million worth of T-bills in the open market, what will happen to domestic interest rates and the money supply? If the Fed does not do the open market sale, what will happen to domestic interest rates and the money supply? In which case is the foreign exchange transaction sterilized?

Suggested Readings

Adam S. Posen and Arvind Subramanian call for more monetary policy in "A Global Approach Is Needed to Beat Inflation," in the Op-Ed section of the *Financial Times*, August 21, 2008. The article is available online at **http://iie.com/publications/opeds/oped.cfm?ResearchID=992.**

The "Monetary Policy Report to the Congress" always has a section on the external (rest-of-the-world) sector. The report is available online at **http://www.federalreserve.gov/boarddocs/hh/.**

Check out foreign exchange rate data at **http://www.federalreserve.gov/releases/h10/update//** or **http://research.stlouisfed.org/fred2/categories/15.**

The National Bureau of Economic Research Working Paper Series presents preliminary work by top researchers in economics. Two relevant recent papers are: #13815, "A Long Term Perspective on the Euro," by Michael Bordo and Harold James, 2008, which places the development of the euro in historical context; and #13736, "Global Forces and Monetary Policy Effectiveness," by Jean Boivin and Marc Giannoni, 2007, which finds that nations still appear to have the ability to employ monetary policy despite globalized capital markets.

In their IMF Working Paper no. 07/279, "Financial Globalization and Monetary Policy," Michael Devereux and Alan Sutherland find that price stability brings additional benefits in a more globalized world and should remain the primary focus of central bankers.

A recently published collection of academic papers, *International Monetary Policy After the Euro*, 2005, edited by the Nobel Prize–winning economist Robert Mundell, together

with Paul Zak and Derek Schaeffer, presents a variety of positions regarding the impact of the euro on global monetary policy.

For a survey that looks at international monetary policy coordination since the end of Bretton Woods, see "International Coordination of Macroeconomic Policies: Still Alive in the New Millennium?" by Laurence H. Meyer, Brian M. Doyle, Joseph E. Gagnon, and Dale W. Henderson, *International Finance Discussion Papers Number 723* (April 2002). The paper is available online at **http://www.federalreserve.gov/pubs/ifdp/2002/723/ifdp723.pdf.**

For a paper that shows that business cycles were more coordinated in the post-Bretton Woods era, see "International Business Cycles Under Fixed and Flexible Exchange Rate Regimes," by Michael A. Kouparitsas, WP 2003–28, Federal Reserve Bank of Chicago (November 29, 2003). The paper is available online at **http://www.chicagofed.org/publications/workingpapers/papers/wp2003–28.pdf.**

For students interested in a "famous" fixed exchange rate system, the gold standard, see *The Key to the Gold Vault*, published by the New York Fed in 1991 (revised 2003). It is free for the asking from the Public Information Department, Federal Reserve Bank of New York, 33 Liberty Street, New York, NY 10045 and available online at **www.newyorkfed.org/education/addpub/goldvaul.pdf.**

Two interesting *Fedpoints* published by the Federal Reserve Bank of New York are "Federal Reserve in the International Arena" (June 2003) and "Balance of Payments" (June 2004). Both are available online at **http://www.newyorkfed.org/aboutthefed/fedpoints.html.**

For a discussion of "Short-Run Independence of Monetary Policy Under Pegged Exchange Rates and Effects of Money on Exchange Rates and Interests," see the article by Lee E. Ohanian and Alan C. Stockman, *Journal of Money, Credit, and Banking* 29, no. 2 (November 1997): 783–806. Enrique G. Mendoza's "Comment on Short-Run Independence of Monetary Policy Under Pegged Exchange Rates" can be found in the same issue, 807–810.

For a broad view of critical international financial events since World War II and their effects on U.S. monetary policy, see Paul Volcker and Toyoo Gyohten, *Changing Fortunes* (New York: Times Books, 1992).

Endnotes

1. Speech by Alan Greenspan at the University of California, Berkeley (September 4, 1998).
2. Actually, the G-7 nations resulted from the 1986 expansion of a group of five (G-5) nations that had consulted since the flexible exchange rate system was put into place in the early 1970s. When Russia participates, it is referred to as the G-8. The original G-5 nations were the United States, the United Kingdom, France, Japan, and West Germany.

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Glossary

A

125s A specialized type of home equity loan popular during the real estate bubble, 2002–2007, in which the borrower is allowed to borrow up to 125 percent of a home's value.

401(k) Plan A special type of defined-contribution plan introduced in 1981 allowing for greater flexibility in employer and employee contributions.

Actuaries Insurance professionals trained in the mathematical aspects of insurance who are responsible for calculating policy premiums.

Adaptive Expectations Expectations formed by looking back at past values of a variable.

Adjustable (Variable) Rate Loans Loans where the interest rate is adjusted up or down periodically as the cost of funds to the lender changes.

Adjustable (Variable) Rate Mortgages (ARMs) Mortgages where the interest rate is adjusted periodically to reflect changing market conditions.

Adverse Selection Problem When the least-desirable borrowers pursue a loan most diligently.

Agency of a Foreign Bank A U.S. banking office of a foreign bank that can only borrow funds in the wholesale and money markets and is not allowed to accept retail deposits.

Alt-A (Stated Income) Mortgage A mortgage loan made to a borrower with good credit where the lender does not verify the income stated by the borrower.

American Stock Exchange (AMEX) An historically important stock exchange located in New York City, recently merged with NASDAQ. It currently handles about 10 percent of all securities trades in the United States and is relatively important in small-cap stocks and exchange traded funds (ETFs).

Amortization The paying off of the principal of a loan over the life of the loan.

Annuitant The owner of an annuity.

Annuity An insurance contract that provides a periodic income at regular intervals for a specified amount of time, such as a number of years or for the life of the beneficiary.

Appreciated Description of a currency that has increased in value relative to another currency.

Appreciation A rise in the value of a currency in terms of another currency under a flexible exchange rate system.

Arbitrageurs Traders who make riskless profits by buying in one market and reselling in another market at a higher price.

Asked Price The price at which a dealer (market maker) is willing to sell securities.

Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) A new lending facility where commercial banks or bank holding companies can borrow from the AMLF to purchase asset–backed commercial paper from money market mutual funds. Designed to reduce the strains on money market mutual funds due to disintermediation.

Asset-Backed Securities Securities that result from the process of securitization.

Asymmetric Information When a potential borrower knows more about the risks and returns of an investment project than the bank loan officer does.

Automated Clearinghouse (ACH) A function of the Fed that assists the government and private sectors in making automated direct payments of payroll checks into checking accounts, and authorizes transfers for insurance premiums, mortgage payments, other bills, and certain online or telephone transfers.

Automated Teller Machine (ATM) A machine that permits a depositor to make deposits and withdrawals to an account even when the financial institution is closed.

Average Marginal Tax Rate The average of the marginal tax rates of all taxpayers.

B

Backup Line of Credit A bank's promise to lend funds to a borrower on demand. These are often used to assist commercial paper issuers with their payment obligations.

Balance of Goods and Services Net exports of services plus the trade balance.

Balance of Payments The record of transactions between the United States and its trading partners in the rest of the world over a particular period of time.

Balance on Current Account The balance of goods and services plus net unilateral transfers.

Bank for International Settlements (BIS) An international financial organization that promotes international cooperation

among central banks and provides facilities for international financial operations.

Bank Holding Company A corporation that owns several firms, at least one of which is a bank.

Bank Runs When many depositors simultaneously attempt to withdraw their funds from a bank.

Bankers' Acceptances Money market instruments created in the course of international trade to guarantee bank drafts due on a future date.

Banking Reform Acts of 1933 and 1935 Statutes passed by Congress in response to the collapse of the banking system between 1930 and 1933.

Barter Trade of goods for goods.

Basel Accord A 1988 agreement among 12 countries that established international capital standards for banks.

Bearer Bonds Bonds in which the bond's owner clips the coupon from the bond and sends it to the issuer, who then returns the coupon payment.

Beneficiary The person who receives an insurance payment or annuity stream after a policyholder dies.

Beta A measure of the overall variability of a stock relative to changes in the entire stock market.

Bid Price The price at which a dealer (market maker) is willing to buy securities.

Board of Governors The seven governors of the Fed appointed by the president with Senate approval for 14-year terms.

Bond Indenture A document that outlines the terms of a bond issuance.

Bretton Woods Accord A 1944 agreement negotiated by the major industrialized countries that established fixed exchange rates with the U.S. dollar serving as the official reserve currency.

Broker An individual who arranges trades between buyers and sellers of securities for a fee.

Business Cycle Short-run fluctuations in economic activity as measured by the output of goods and services.

C

Call Options Options that give the buyer of the option the right, but not the obligation, to buy a standardized contract of a financial instrument at a strike price determined today.

Call Provisions Provisions of a bond indenture that specify whether the corporation can pay off the bonds before they mature (and if so, under what terms).

Capital Account The financial flow of funds and securities between the United States and the world.

Capital Asset Pricing Model A model that asserts that the value of a share of stock includes a risk-free return, a market risk premium, and a firm-specific risk premium that is based on beta.

Capital Inflows Purchases of U.S. financial securities by foreigners and borrowing from foreign sources by U.S. firms and residents.

Capital Market The market for financial assets with an original maturity of greater than one year.

Capital Outflows Purchases of foreign financial securities by U.S. residents and borrowing by foreigners from U.S. banks and other domestic sources.

Carrying Costs Interest costs for funds used to purchase the security underlying a futures contract plus any transactions costs.

Casualty (Liability) Insurance Insurance exchanged for premiums that protects insured policyholders from the financial responsibilities to those harmed by an accident, product failure, or professional malpractice.

Central Liquidity Facility (CLF) A lender of last resort created in 1978 for credit unions experiencing temporary liquidity problems.

Certificates of Deposit (CDs) Debt instruments issued by commercial banks having a minimum denomination of $100,000, fixed interest rate, and that return the principal at maturity. They may be negotiable (tradable) or non-negotiable (not tradable).

Chartered Given permission to engage in the business of commercial banking. Banks must obtain a charter before opening.

Checkable Deposits Deposits that are subject to withdrawal by writing a check.

Circuit Breakers Reforms introduced in 1987 on the NYSE to temporarily halt market trading if prices change by a specified amount.

Clearinghouse The part of an organized exchange that takes on the responsibility of enforcing a contract after the agreement is struck.

Closed-End Investment companies that sell a limited number of shares like other corporations but usually do not buy back outstanding shares.

Closing Costs Costs to obtain a mortgage, the bulk of which are paid by the borrower; they include

such things as loan origination fees, surveys, appraisals, credit reports, title insurance, recording fees, and processing fees.

Coinsurance The percentage share or fixed amount of a claim that must be paid by the policyholder. Many health insurance companies require 80/20 cost sharing, with the insurer bearing 80 percent of the cost and the policyholder paying 20 percent. The policyholder's share is sometimes capped at some maximum out-of-pocket expense.

Collateral The building (structure) or land that will be foreclosed on and repossessed if the borrower fails to make the scheduled payments; the lender then sells the property to recoup some or all of the losses.

Collateral Bonds Bonds backed by financial assets.

Collateralized Mortgage Obligations Securities developed by Freddie Mac that redirect the cash flows (principal and interest) of mortgage-backed securities to various classes of investors, thus creating financial instruments with varying prepayment risks and varying returns.

Commercial Banks Depository institutions that issue checkable, time, and savings deposit liabilities and, among other things, make mortgages and loans to commercial businesses.

Commercial Paper Short-term debt instruments issued by corporations.

Common Stock Equity claims representing ownership of the net income and assets of a corporation. Common stockholders are "residual claimants," since their dividends are paid out of profits remaining after payment of interest to lenders and dividends to preferred stockholders. Common stockholders may vote for the board of directors, and thus have the potential to exert control over decisions of managers.

Community Reinvestment Act Legislation passed by Congress in 1977 to increase the availability of credit to economically disadvantaged areas and to correct alleged discriminatory lending practices.

Compensating Balance A form of collateral that specifies a portion of loan proceeds to be maintained on deposit at the bank making the loan.

Competitive Bid A bid that specifies both the quantity desired and the discount rate offered. If the discount rate is within the range accepted, the bidder is entitled to the entire quantity sought.

Compounding A method used to determine the future value of a sum lent today.

Comptroller of the Currency The federal agency that charters national banks.

Conforming Loans A specific type of conventional loan that complies with criteria that allows it to be packaged together with other conforming loans and resold in the secondary market to Fannie Mae or Freddie Mac; as of 2009, conforming loans are for a maximum amount of $625,000.

Consol A perpetual bond with no maturity date; the issuer is never obliged to repay the principal but makes coupon payments each year, forever.

Consumer Price Index (CPI) A price index that measures the cost of a market basket of goods and services that a typical urban consumer purchases.

Contingent Claims Claims such as casualty and life insurance benefits that offer the public protection from the often catastrophic financial effects of theft, accidents, natural disasters, and death.

Contributory Plans Pension plans in which both the employee and employer contribute.

Conventional Mortgages Mortgages made by financial institutions and mortgage brokers without the federal insurance that the principal and interest will be repaid.

Convergence The phenomenon in which the futures price is bid up or down to the spot price plus carrying costs; the futures price approaches the spot price as the expiration date draws nearer.

Convertible Insurance policies containing a clause allowing the policyholder to change a term insurance policy into a permanent (whole, universal, variable) life insurance product.

Convertible Bonds Bonds in which the bondholder has a right to convert the bonds to a predetermined number of shares of common stock; particularly beneficial to the bondholder if the shares of stock appreciate greatly.

Corporate Bonds Long-term debt instruments issued by corporations.

Core PCEPI The PCEPI excluding the prices of energy and food, which are less amenable to control by the Fed.

Coupon Payments The periodic payments made to bondholders, which are equal to the principal times the coupon rate.

Coupon Rate The fixed interest rate stated on the face of a bond.

Credit In the balance of payments, any item that results in a payment by foreigners to Americans.

Credit Derivatives Contracts that transfer the default risk of a loan or other debt instrument from the bank (or holder of the loan) to a guarantor who receives a fee for accepting the risk.

Credit Enhancer An insurance company or a bank that guarantees a security issue or offers a letter of credit in its support for a fee.

Credit Rationing Charging a lower interest rate than some borrowers are willing to pay and apportioning loans and loan amounts only to very safe borrowers, with favorable credit ratings and low probability of defaulting.

Credit Report An account or file of an individual's legal and credit history. It includes information about previous legal judgments as well as information about the types and amounts of one's outstanding debts as well as a record of one's payment history.

Credit Reporting Agencies Companies such as Experian, Equifax, and TransUnion that gather credit and legal information on individuals, compile it into a credit report, and then provide it to prospective creditors, insurers, and employers for a fee.

Credit Risk The probability of a debtor not paying the principal and/or the interest due on an outstanding debt.

Credit Score The three-digit number that predicts a loan applicant's likelihood of default based upon his or her credit history.

Credit Union National Association (CUNA) The largest credit union trade association in the United States, it provides bulk purchases of supplies, automated payment services, credit card programs, and various investment options to member credit unions.

Credit Union National Extension Board (CUNEB) A privately created organization formed in 1921 to expand the credit union movement across the country; a forerunner to the CUNA.

Credit Unions Depository institutions that are cooperative, nonprofit, tax-exempt associations operated for the benefit of members who share a common bond.

Currency Board An organized body within a country with the sole responsibility and power to define the value of the country's currency.

Currency Swaps Agreements whereby one party agrees to trade periodic payments, over a specified period of time, in a given currency, with another party who agrees to do the same in a different currency.

Current Account Transactions that involve currently produced goods and services, including the balance of goods and services.

Current Yield The coupon payment divided by the current price.

D

Dealer A person who arranges trades between buyers and sellers and who stands ready to be a principal in a transaction; a market maker.

Debenture Bonds Bonds with no specific collateral backing but having a general claim on the other unpledged assets of the issuer.

Debit In the balance of payments, any transaction that results in a payment to foreigners by Americans.

Debt Deflation A real increase in debt burdens caused by falling incomes and prices and debt burdens that are denominated in dollars.

Debt-to-Income Ratio A financial ratio used to assess a loan applicant's capacity for repaying a loan, based on the share of one's total monthly debt payments relative to his or her gross monthly income.

Deductible A fixed amount that the insured policyholder is required to pay before insurance coverage becomes effective.

Default When a borrower fails to repay a financial claim.

Default Risk The risk that the borrower will not make the principal and interest payments as scheduled.

Deficit Sector A sector where the combined deficits of net borrowers are greater than the combined surpluses of the net lenders.

Defined-Benefit Pension Plan A contract promising a specific level of income upon retirement based on the worker's years of service and level of earnings.

Defined-Contribution Pension Plan A contract specifying that a particular and periodic share of an employee's wages will be contributed by employers, employees, or both.

Deflation A drop in the overall price level as measured by a price index.

Demand Deposits Non-interest-earning checking accounts issued by banks.

Demand for Loanable Funds The demand for borrowed funds by household, business, government, or foreign net borrowers.

Demand for Money The entire set of interest rate–quantity

demanded combinations as represented by a downward-sloping demand curve for money.

Deposit Insurance Fund (DIF) Result of the combination of the Bank Insurance Fund and Savings Association Insurance Fund, effective March 31, 2006.

Depository Institutions Financial intermediaries that issue checkable deposits.

Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA) The statute that removed many of the regulations enacted during the Great Depression; it phased out Regulation Q, established uniform and universal reserve requirements, increased the assets and liabilities that depository institutions could hold, authorized NOW accounts, and suspended usury ceilings.

Depreciated Description of a currency that has decreased in value relative to another currency.

Depreciation A decrease in the value of a currency in terms of another currency under a flexible exchange rate system.

Deregulate To dismantle existing regulations.

Deregulation The removing or phasing out of existing regulations.

Derivative Instruments Financial contracts (e.g., forwards, futures, options, and swaps) whose values are "derived" from the values of other underlying instruments, such as foreign exchange, bonds, equities, or an index.

Derivative Markets Financial futures markets where the value of the financial instruments (the futures and forward agreements) "derive" their values from the underlying instruments such as the government securities, the shares of stock, etc., that are traded on the future date; financial futures and forward markets, among others, are examples of derivative markets.

Designated Order Turnaround System (SuperDOT) A computer system used for trades of fewer than 3,000 shares on the NYSE.

Devaluation Under fixed exchange rates, a reduction in the value of a currency by the monetary authorities relative to the official reserve asset.

Devalue Under a fixed exchange rate system, to decrease the value of a country's currency.

Direct Finance When net lenders lend their funds directly to net borrowers.

Direct Placements When the issuer of a security sells straight to a buyer without the assistance of a broker or dealer.

Disability Insurance Policies exchanged for premiums that are designed to cover a portion of an insured worker's previous income if the worker becomes unable to work because of illness or injury.

Discount from Par When a bond sells below its face value because interest rates have increased since the bond was originally issued.

Discount Rate The rate that healthy depository institutions are charged for short-term borrowing of reserves from the Fed. Today, the primary credit rate is referred to as the discount rate.

Discounting A method used to determine the present value of a sum to be received in the future.

Disintermediation The reversal of the financial intermediation process whereby funds are pulled from financial intermediaries, such as banks, and moved directly into open market instruments like commercial paper or government securities.

Diversification The allocation of surplus funds to more than one financial instrument in order to reduce risk.

Diversification The branching out of financial conglomerates into several product lines to reduce the dependence of the conglomerates on any single product line.

Domestic Nonfinancial Debt (DNFD) An aggregate that is a measure of total credit market debt owed by the domestic nonfinancial government and private sectors.

Double Coincidence of Wants A bartering situation in which each person involved in a potential exchange has what the other person wants.

Dow Jones Industrial Average (the Dow) An index that measures movements in the stock prices of 30 of the largest companies traded on the NYSE.

Dual Banking System The system whereby a bank may have either a national or a state charter.

Due Diligence The investigative process used by a lender, investor, or investment banker to ensure that a borrower's or security issuer's financial statements are accurate.

Duration Analysis A measure of interest rate risk that seeks to measure how responsive the value of a bank's assets, liabilities, and net worth are to changes in interest rates. Duration is reported in chronological terms.

Duration Gap Analysis A type of duration analysis that involves subtracting the duration of a bank's interest-rate-sensitive assets

from its interest-rate-sensitive liabilities.

E

Economic Projections Goals for GDP, unemployment, and inflation over the next three years, set by the Fed four times each year.

Economics The study of how society decides what gets produced and how, and who gets what.

Economies of Scale Gains from bigness that may result from several firms being able to streamline management and eliminate the duplication of effort that would result from several separate firms.

Economies of Scope Advantages to firms being able to offer customers several financial services under one roof.

Efficient Markets Hypothesis This hypothesis states that when financial markets are in equilibrium, the prices of financial instruments reflect all readily available information.

Electronic Funds Transfer System The transfer of funds to third parties in response to electronic instructions rather than a paper check.

Emergency Economic Stabilization Act of 2008 (EESA) A law enacted in September 2008 in response to the ongoing financial crisis that authorized the U.S. Treasury to purchase up to $700 billion of "toxic" securities.

Euro CDs Certificates of deposit issued by the foreign branches of commercial banks but denominated in the currency of the branch's *home* country (e.g., Citibank issuing a dollar-denominated CD in Japan).

Eurodollars Dollar-denominated deposits held abroad.

Exchange Rate The number of units of foreign currency that can be acquired with one unit of domestic money.

Exchange Rate Risk The risk that changes in the exchange rate can adversely affect the value of foreign exchange or foreign financial instruments.

Exchange-Traded Funds (ETFs) A security created by a securities firm depositing into a fund that mirrors the holdings of stocks in an index.

Expansion The phase of the business cycle in which economic activity increases and unemployment falls.

Expectations Theory A theory holding that the long-term interest rate is the geometric average of the present short-term rate and the short-term rates expected to prevail over the term to maturity of the long-term security.

External Financing The financing of spending that exceeds current receipts by expanding either debt or equity.

F

Factoring Companies Specialized finance companies that purchase the accounts receivable of other firms at a discount.

Farm Credit Financial Assistance Corporation (FACO) A GSE that issues bonds to assist the FFCBFC, which was having financial problems at the time FACO was created.

Federal Deposit Insurance Corporation (FDIC) The federal agency that insures the deposits of banks and savings associations.

Federal Deposit Insurance Corporation Improvement Act (FDICIA) Legislation passed by Congress in 1991 to enact regulatory changes that ensure the safety and soundness of the banking and thrift industries.

Federal Deposit Insurance Reform Act Of 2005 The Reform Act that merged the BIF and SAIF into the deposit insurance fund (DIF), increased the deposit insurance coverage for retirement accounts to $250,000 and adjusted coverage.

Federal Farm Credit Banks Funding Corporation (FFCBFC) A GSE that issues bonds and discount notes to make loans to farmers to increase the funds flowing into agriculture.

Federal Financial Institutions Examinations Council (FFIEC) A federal agency that prescribes uniform principles, standards, and report forms for the federal examination of financial institutions by the Fed, the FDIC, and the Office of the Comptroller of the Currency and that makes recommendations to promote uniformity in the supervision of financial institutions.

Federal (Fed) Funds Loans of reserves (deposits at the Fed) between depository institutions, typically overnight.

Federal (Fed) Funds Rate The interest rate charged on overnight loans of reserves among commercial banks.

Federal Home Loan Bank Board (FHLBB) The primary federal regulatory agency for savings associations from 1932 until 1989; replaced by the Office of Thrift Supervision (OTS).

Federal Home Loan Bank The regulatory body of the savings and loan industry until 1989.

Federal Home Loan Mortgage Corporation (Freddie Mac) A publicly traded, government-sponsored enterprise that sells securities and uses the proceeds to buy mortgages primarily of thrifts. Freddie Mac was put into receivor-

ship by the U.S. government in September 2008 because it was virtually insolvent due to the ongoing crisis in the mortgage market.

Federal Housing Administration (FHA) A federal agency that, for a .5 percent fee, insures mortgage loans made by privately owned financial institutions up to a certain amount if the borrowers meet certain conditions defined by the FHA.

Federal Housing Finance Agency (FHFA) An independent federal agency that regulates Fannie Mae and Freddie Mac and was established by law on July 30, 2008, replacing the Federal Housing Finance Board and the Office of Federal Housing Enterprise Oversight. The FHFA had far greater regulatory powers than the previous regulators, including the ability to put the GSEs into conservatorship.

Federal National Mortgage Association (Fannie Mae) A publicly traded, government-sponsored enterprise that sells securities that are now backed by the government and uses the proceeds to buy mortgages primarily of banks. Fannie Mae was put into receivorship by the U.S. government in September 2008 because it was virtually insolvent due to the ongoing crisis in the mortgage market.

Federal Open Market Committee (FOMC) The principal policy-making body within the Federal Reserve System.

Federal Reserve (The Fed) The central bank of the United States that regulates the banking system and determines monetary policy.

Federal Reserve Act The 1913 congressional statute that created the Federal Reserve System.

Federal Savings and Loan Insurance Corporation (FSLIC) The federal agency that insured the deposits of member savings associations from 1934 until 1989; replaced by the FDIC's Savings Association Insurance Fund (SAIF).

Fedwire An electronic system for irrevocably and instantaneously transferring very large sums of funds (wholesaling funds) among about 9,500 Fedwire participants, which are generally very large institutions.

Finance The study of how the financial system coordinates and channels the flow of funds from lenders to borrowers—and vice versa—and how new funds are created by financial intermediaries during the borrowing process.

Finance Companies Intermediaries that lend funds to households to finance consumer purchases and to firms to finance inventories.

Financial Claims Claims issued by net borrowers in order to borrow funds from net lenders who purchase the claims; assets to the purchaser, liabilities to the issuer.

Financial Conglomerates Firms that own and operate several different types of financial intermediaries and financial institutions on a global basis.

Financial Crisis A critical upset in a financial market(s) characterized by sharp declines in asset prices and the default of many financial and nonfinancial firms.

Financial Forward Contract An agreement in which the terms, including price, are completed today for a transaction that will occur in the future.

Financial Forward Markets Markets that trade financial forward agreements usually arranged by banks or other brokers and dealers.

Financial Futures Standardized futures contracts that trade financial instruments on a future date according to terms (including the price) determined today.

Financial Futures Markets Organized markets that trade financial futures including the Chicago Board of Trade, the Chicago Mercantile Exchange, and the London International Financial Futures Exchange.

Financial Holding Companies (FHCs) Bank holding companies that have applied for and been certified to become FHCs; FHCs can engage in an even broader array of financial-related activities than bank holding companies, including securities underwriting and dealing, insurance agency and underwriting activities, and merchant banking activities; financial holding companies may engage in any other financial and nonfinancial activities as determined by the Fed.

Financial Industry Regulatory Authority (FINRA) A nongovernmental regulator of the U.S. securities industry with authority over more than 5,000 brokerage firms. FINRA was created in July 2007 by consolidation of regulatory functions of the NASD and the New York Stock Exchange.

Financial Innovation The creation of new financial instruments, markets, and institutions in the financial services industry.

Financial Instability Hypothesis Hyman Minsky's theory that (1) the mixture of hedge, speculative, and Ponzi spending units in the economy determines the economy's predisposition to a financial crisis, and (2) after sustained periods of prosperity,

spending units tend to take on more debt, which may in time lead to another crisis.

Financial Institutions Firms that provide financial services to net lenders and net borrowers; the most important financial institutions are financial intermediaries.

Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) of 1989 An act that attempted to resolve the S&L crisis by creating a new regulatory structure, limiting the assets S&Ls can acquire, and requiring S&Ls to maintain adequate capital.

Financial Intermediaries Financial institutions that borrow from net lenders for the purpose of lending to net borrowers.

Financial Markets Markets in which spending units trade financial claims.

Financial Stability Forum (FSF) An organization of representatives of central banks, Treasury departments, and international financial institutions created in 1999 to promote international financial stability through the exchange of information and to foster cooperation in international financial supervision and surveillance.

Financing Corporation (FICO) A GSE created in response to the S&L crisis that issued bonds to help shore up the FSLIC.

Firm-Specific Risk Premium A risk measured by beta that shows the overall sensitivity of the stock's return relative to changes in the entire market.

Fiscal Policy Government spending and taxing decisions to speed up or slow down the level of economic activity.

Five Cs of Credit The primary factors lenders must assess and manage to avoid excessive default risk exposure; these include a loan applicant's capacity, character, capital, collateral, and conditions.

Fixed Exchange Rate System An exchange rate system in which currency values do not fluctuate, and in which countries agree to buy or sell their currency to maintain the agreed upon exchange rates with other currencies.

Fixed Interest Rate Mortgage Mortgage where the interest rate remains the same over the life of the loan.

Flexible Exchange Rate System An exchange rate system in which the value of a currency is determined by supply and demand.

Floating (Flexible) Exchange Rate System An exchange rate system in which currency values are determined by supply and demand and fluctuate in response to changes in supply and demand.

Floor-Plan Loans Finance company loan products that allow dealers of automobiles, boats, and construction equipment to use their inventory as collateral for loans that are repaid when vehicles are sold.

Flow of Funds A social accounting system that divides the economy into a number of sectors including the household, business, government, foreign, and financial sector.

Foreign CDs Certificates of deposit issued by the foreign branches of commercial banks and denominated in the currency of the branch's *host* country (e.g., Citibank issuing a yen-denominated CD in Japan).

Foreign Currency (Money) Supplies of foreign exchange.

Foreign Exchange Supplies of foreign currencies.

Foreign Exchange Futures Contract A standardized contract to buy or sell a certain amount of a foreign currency on a date in the future at a price determined today.

Foreign Exchange Market The market for buying and selling the different currencies of the world.

Forward Rate The price today for a delivery on a future date.

Freedom of Information Act (1966) A 1966 law that requires more openness in government and more public access to government documents.

Full Dollarization Abandonment of a country's own currency to adopt another country's currency as its official currency.

Fund of Funds A mutual fund that invests in a portfolio of other mutual funds rather than individual stocks and/or bonds.

Futures Contracts Standardized agreements in agricultural and commodity markets to trade a fixed amount of the product or commodity on specific dates in the future at a price determined today.

G

Garn-St. Germain Act of 1982 A statute that, along with the DIDMCA, deregulated the financial structure, expanded the lending power of S&Ls and authorized money market deposit accounts and Super NOW accounts.

General Obligation Bonds Bonds that are paid out of the general revenues and backed by the full faith and credit of the issuer.

Geometric Average An average that takes into account the effects of compounding; used to calculate the long-term rate from the short-term rate and the short-term rates expected to prevail over the term to maturity of the long-term security.

Glass-Steagall Act of 1933 Banking legislation that established Regulation Q interest rate ceilings, separated commercial and investment banking, and created the FDIC. It was enacted in response to the financial crisis that led to the Great Depression.

Government Agency Securities Bonds issued by private enterprises that were publicly chartered by Congress to reduce the cost of borrowing to certain sectors of the economy, such as farming, housing, and student loans.

Government National Mortgage Association (Ginnie Mae) A government-owned program that guarantees the timely payment of interest and principal on bundles of at least $1 million of standardized mortgages.

Government-Sponsored Enterprises (GSEs) Publicly held and traded enterprises that have been chartered by Congress to reduce the cost of borrowing in such sectors as housing, farming, the savings and loan industry, and student loans.

Gramm-Leach-Bliley Act (GLBA) Legislation that removed decades-old barriers between banking and other financial services by creating financial holding companies that linked commercial banks with securities firms, insurance firms, and merchant banks; it was passed by Congress in November 1999 and became effective March 2000.

H

Health Insurance Companies Intermediaries that offer protection, in exchange for premiums, against the financial costs associated with events such as doctor visits, hospital stays, and prescriptions drugs.

Health Maintenance Organizations (HMOs) Specialized health care insurers that provide almost complete medical care in exchange for fixed-per-person premiums.

Hedge An investment made to reduce risk.

Hedge Fund A nontraditional type of mutual fund formed as a partnership of up to either 99 or 499 wealthy investors with large minimum investments; attempts to earn maximum returns regardless of rising or falling financial prices.

Hedge Spending Unit A spending unit such as a household or firm where the anticipated revenues (inflows) significantly exceed the anticipated payment obligations (outflows).

Home Equity Lines of Credit Credit cards that are secured by a second mortgage on one's home.

Home Equity Loan A type of mortgage that allows a borrower to use the equity in his or her home as collateral for a loan or revolving line of credit.

Housing-to-Income Ratio A financial ratio used to assess a mortgage loan applicant's capacity to repay a loan, based on the share of total housing expenses relative to one's gross monthly income.

I

I Savings Bonds (I-Bonds) Savings bonds whose interest rate is adjusted for changes in inflation.

Impact Lag The time between when an action is taken and when that action has a significant impact on economic variables.

Income Gap The difference between a bank's interest-rate-sensitive assets (SAs) and its interest-rate-sensitive liabilities (SLs).

Income Gap Analysis An evaluation of the bank's exposure to interest rate risk that involves subtracting the institution's interest-rate sensitive liabilities (SLs) from its interest-rate sensitive assets (SAs). The resulting "gap" describes the degree to which the bank income will be affected by changes in interest rates.

Index-Arbitrage Trading The purchasing (or selling) of a basket of stocks, usually through program trading, with the simultaneous selling (or purchasing) of a futures agreement in the same basket of securities in order to make a riskless profit (arbitrage) from the price differential between the basket of stocks and the futures agreement.

Indexed Mutual Funds A mutual fund that holds the same basket of securities that are represented in an index such as the S&P 500 or the Wilshire 5000, so that the investor receives roughly the same return as the index to which the fund is tied.

Indirect Finance When net borrowers borrow from financial intermediaries that have acquired the funds to lend from net lenders.

Individual Retirement Accounts (IRAs) Tax-advantaged savings accounts administered by insurance companies, pension funds, and other intermediaries for the purposes of accumulating wealth for retirement.

Inflation Premium The amount of nominal interest added to the real interest rate to compensate the lender for the expected loss in purchasing power that will accompany any inflation.

Inflation Rate The rate of change in the Consumer Price Index, which measures the growth

rate of the average level of prices paid by consumers.

Initial Public Offering (IPO) An offering of stocks or bonds to the public by a company that has not previously sold securities to the public.

Insolvent Describes the condition in which a bank's liabilities are greater than the value of its assets.

Insurance Company A contractual-type financial intermediary that offers the public protection against the financial costs associated with the loss of life, health, or property in exchange for a premium.

Interest Rate The cost to borrowers of obtaining money and the return (or yield) on money to lenders.

Interest Rate Cap An agreement whereby the seller of the cap agrees, for a fee, to compensate the cap buyer when an interest rate index exceeds a specified strike rate.

Interest Rate Floor An agreement whereby the seller of the cap agrees, for a fee, to compensate the cap buyer when an interest rate index falls below a specified strike rate.

Interest Rate Parity The theory that in equilibrium, interest rates adjust so that after adjustments have been made for expected inflation and exchange rate risk, returns are equalized across countries.

Interest Rate Risk The risk that nominal interest rates rise and the value of long-term assets fall or that the interest rate will unexpectedly change so that the costs of an FI's liabilities exceed the earnings on its assets.

Interest Rate Swaps Financial instruments that allow financial institutions to trade their interest payment streams to better match payment inflows and outflows.

Internal Financing Spending money balances on hand or liquidating financial or real assets to finance spending that exceeds current receipts.

International Bank for Reconstruction and Development (IBRD) A bank that makes 12- to 15-year loans to poor, but not the poorest, countries, charging an interest rate just above the rate at which the bank borrows.

International Banking Facilities (IBFs) Financial institutions located in the United States that cater to the needs of foreign individuals, corporations, and/or governments. They allow non-U.S. residents to hold unregulated Eurodollar deposits.

International Development Association An association that makes interest-free loans with a maturity of 35 to 40 years to the world's poorest countries.

International Finance Corporation An organization that mobilizes funding for private enterprise projects in poor countries.

International Financial System The numerous rules, customs, instruments, facilities, markets, and organizations that enable international payments to be made and funds to flow across borders.

International Monetary Fund (IMF) An organization created in 1944 to oversee the monetary and exchange rate policies of its members, who pay quotas that are used to assist countries with temporary imbalances in their balance of payments.

Interstate Banking and Branching Efficiency Act (IBBEA) Signed into law in September 1994, an act by Congress that effectively allows unimpeded nationwide branching.

Investment Banks Financial institutions that design, market, and underwrite new issuances of securities in the primary market.

Investment Companies Companies that own and manage a large group of different securities for investors who have purchased shares of the companies.

J

Junk Bonds Highly speculative, high yield bonds with low credit ratings that are not recommended for investment because of high credit risk.

K

Keogh Plans Tax-advantaged savings accounts administered by banks and other financial intermediaries for the retirement needs of self-employed people.

L

Laissez-Faire The view that government should pursue a hands-off policy with regard to the economy.

Lender of Last Resort The roll of the Fed as a provider of liquidity to commercial banks (and increasingly other financial firms) during crises.

Letters of Credit A form of credit enhancement offered by banks that guarantees a bank will redeem a security if the issuer does not.

Leverage Ratio The ratio of the firm's debt relative to its equity.

Leveraging The degree to which a spending unit relies on borrowed funds.

Lien A public record that stays with the property title and gives the lender the right to repossess

and sell the property if the borrower defaults.

Life Insurance Companies Intermediaries that offer protection against the financial costs associated with events such as death and disability in exchange for premiums.

Limit Orders Orders that instruct the broker or dealer to purchase securities at the market price up to a certain maximum or to sell the securities at the market price if it is above a certain minimum.

Liquidity The ease with which a financial claim can be converted to cash without loss of value.

Liquidity Premium The extra return required to induce lenders to lend long-term rather than short-term.

Liquidity Ratio A commonly used measure of liquidity and interest rate risk. It is computed by taking the difference between a bank's short-term investments and liabilities and dividing them by the bank's assets.

Liquidity Risk The risk that an FI will be required to make a payment when the intermediary has only long-term assets that cannot be converted to liquid funds quickly without a capital loss.

Load A sales commission paid to a broker to purchase mutual funds.

Loan Commitments Promises made by banks to a firm to lend a given amount of funds at a particular rate for a specified period of time.

Loan Participation A loan agreement that allows an originating bank to give partial interest in a loan to one or more additional banks.

Loan-to-Value Ratio A financial ratio used to assess the degree of equity or capital a loan applicant has at stake in an investment project. It is computed by dividing the total loan amount financed by the total market value of the property.

London Interbank Bid Rate (LIBID) The interest rate at which London banks are willing to *borrow* Eurodollar balances.

London Interbank Offered Rate (LIBOR) The interest rate at which London banks are willing to *loan* Eurodollar balances.

Long-Term Care Insurance Private insurance, purchased typically before assistance is required, by individual payment of premiums. It covers care received either at home or in a facility for someone needing assistance with activities of daily living (bathing, dressing, toileting, transferring, continence, and eating), or suffering severe cognitive impairment (such as Alzheimer's disease). Long-term care insurance is not intended to improve or correct medial problems.

M

M1 Currency in the hands of the public plus checkable deposits.

M2 Everything in M1 plus other highly liquid assets.

Macroeconomics The branch of economics that studies the aggregate, or total behavior of all households and firms.

Maintenance Margin Requirement The minimum amount of equity the investor needs in his account relative to the market value of his stock.

Managed Float Exchange Rate System A system in which currency values fluctuate with changes in supply and demand but central banks may intervene if currency values are thought to be overvalued or undervalued.

Margin Loans Loans to investors for which the proceeds are used to purchase securities.

Margin Requirement The percentage of invested funds that can be borrowed as opposed to being paid in readily available funds; currently, margin requirements are set by the Fed at 50 percent.

Marginal Tax Rate The tax rate paid on the last dollar of income the taxpayer earns.

Market Fundamentals Factors that have a direct effect on future income streams of financial instruments, including the value of the assets and the expected future income streams of those assets on which the financial instruments represent claims.

Market Makers Dealers who link up buyers and sellers of financial securities and sometimes take positions in the securities.

Market Orders Orders by an investor that direct the broker or dealer to purchase or sell securities at the present market price.

Market Risk Premium The risk based on historical data that shows how much on average the ownership of stocks pays over a risk-free return.

McCarran-Ferguson Act Federal statute passed in 1945 that exempts life insurance companies from federal regulation and defers their oversight to state insurance commissioners in each state.

McFadden Act The 1927 act by Congress that outlawed interstate branching and made national banks conform to the intrastate branching laws of the states in which they were located.

Means of Payment (Medium of Exchange) Something generally acceptable for making payments.

Merchandise Exports Foreign purchases of U.S. goods.

Merchandise Imports U.S. purchases of foreign goods.

Merchant Banking Direct equity investment (the purchasing of stock) in a start-up or growing company by a bank.

Microeconomics The branch of economics that studies the behavior of individual decision-making units such as households and business firms.

Monetary Aggregates The measures of money—including M1 and M2—monitored and tracked by the Fed.

Monetary Policy The attempts by the Fed to stabilize the economy and to ensure sufficient money and credit for an expanding economy.

Money Anything that functions as a means of payment (medium of exchange), unit of account, and store of value.

Money Illusion When spending units react to nominal changes caused by changes in prices, even though real variables such as interest rates have not changed.

Money Market The market for financial assets with an original maturity of less than one year.

Money Market Deposit Accounts (MMDAs) Financial claims with limited check-writing privileges, offered by banks since 1982; they earn higher interest than fully checkable deposits and require a higher minimum balance.

Money Market Mutual Funds (MMMFs) Short-term investment pools that use the proceeds they raise from selling shares to invest in various money market instruments.

Moral Hazard Problem When the borrower has an incentive to use the proceeds of a loan for a riskier venture after the loan is funded.

Mortality Tables Schedules used to estimate the number of people of a given age who are expected to die during a year.

Mortgage-Backed Securities Securities backed by a pool of mortgages; they have had a low default risk and provide a steady stream of income.

Mortgage Bonds Bonds backed by real personal property.

Mortgages Loans made to purchase single- or multiple-family residential housing, land, or other real structures, with the structure or land serving as collateral for the loan.

Multiple-Price Method An auction method whereby the seller of securities accepts bids prior to selling securities. Sales are awarded beginning with the highest bidder and continuing toward the lowest until the desired number of securities has been sold. Buyers end up paying different prices for the same securities based upon their respective bids. The Treasury discontinued this auction-pricing method in November 1998.

Municipal Bonds (munis) Bonds issued by state, county, and local governments to finance public projects such as schools, utilities, roads, and transportation ventures; the interest on municipal securities is exempt from federal taxes and from state taxes for investors living in the issuing state.

Mutual Funds Investment-type intermediaries that pool the funds of net lenders, purchase the long-term financial claims of net borrowers, and return the income received minus a fee to the net lenders.

Mutual Savings Bank Savings banks that lack stockholders and whose assets are managed to benefit its collective owners—present and future depositors.

N

National Association of Securities Dealers Automated Quotation System (NASDAQ) An electronic stock market for trading securities. In 2002, it became an investor-owned corporation, completely independent of the National Association of Securities Dealers (NASD), which had founded it in 1971. It lists more companies and trades more shares on average than the NYSE.

National Bank A bank that has received a charter from the Comptroller of the Currency.

National Credit Union Association (NCUA) A federal regulatory agency created in 1970 to charter and regulate federally chartered credit unions and state member institutions.

National Credit Union Share Insurance Fund (NCUSIF) A federal agency created in 1970 to insure the deposits of federally chartered credit unions and state member institutions.

Near Monies Highly liquid financial assets that can easily be converted to transactions money (M1) without loss of value.

Negative Spread When the rate of return on assets is less than the cost of funds on liabilities; this occurs for commercial banks when loan rates are below deposit rates.

Negotiable Certificates of Deposit (CDs) Certificates of deposit with a minimum denomination of $100,000 that can be traded in a secondary market, most with an original maturity of one to 12 months.

Net Borrowers Spending units such as households and firms whose spending exceeds their income.

Net Capital Inflow Status when there is a surplus in the capital account (or "financial account") and capital inflows exceed capital outflows.

Net Lenders Spending units such as households and firms whose income exceeds their spending.

Net Transfer Payments In the current account, the difference between transfer payments received from and transfer payments made to foreigners.

New York Stock Exchange (NYSE) The world's largest market for trading stocks; it trades the stocks of more than 2,800 companies; part of NYSE Euronext since 2007.

No-Fault Insurance Insurance coverage that pays an accident victim regardless of who caused an accident or damage.

No-Load Mutual funds that are purchased directly from the mutual fund company and are not subject to a load.

Nominal Interest Rate The market interest rate, or the real return plus the rate of inflation expected to prevail over the life of the asset.

Nonbanks Other intermediaries and nonfinancial companies that have taken an increasing share of intermediation.

Noncompetitive Bid A bid that includes only the number of T-bills desired.

Noncontributory Plans Pension plans in which only the employer contributes.

O

Off-Balance-Sheet Activities Activities such as standby lines of credit, overdraft protection, unused credit card balances, and other commitments for which a bank is liable but that do not show up on the balance sheet.

Office of Thrift Supervision (OTS) An agency created by the Financial Institutions Reform, Recover, and Enforcement Act (FIRREA) to replace the Federal Home Loan Bank Board as the overseer of the S&L industry.

Official Reserve Account The balance of payments account that records official government transactions in the foreign exchange market to bring the balance of payments into balance.

Official Reserve Asset The asset (such as the dollar or gold) by which other countries define the value of their currency; used as international reserves.

Official Reserve Currency The currency used by other countries to define their own currency; the U.S. dollar was the official reserve currency under the Bretton Woods Accord.

Old Age Survivors and Disability Insurance (OASDI) Core program of Social Security that is funded by payroll taxes to pay retirement and disability payments to eligible individuals and their dependents.

Open Market Operations The buying and selling of government securities by the Fed to change the reserves of depository institutions.

Open-End A mutual fund (type of investment company) that continually sells new shares to the public or buys outstanding shares from the public at a price equal to the net asset value.

Optimal Forecast The best guess possible arrived at by using all of the available information.

Option Premium The premium paid by the buyer of an option to compensate the seller for accepting the risk of a loss with no possibility of a gain.

Options on Futures Options that give the buyer the right, but not the obligation, to buy or sell a futures contract up to the expiration date on the option.

Over-the-Counter (OTC) Market A network of securities dealers that trades stocks of companies not listed on an official exchange such as NASDAQ or the NYSE.

P

Par Value The face value printed on a bond; the amount the bond originally sold for.

Participation Certificate A mortgage-backed security issued by Freddie Mac and backed by a pool of conventional mortgages.

Payments Mechanism The means by which transactions are consummated; that is, how money is transferred in an exchange.

Payoff Method The method of resolving a bank insolvency by paying off the depositors and closing the institution.

Pension Funds Tax-exempt intermediaries set up to provide participants with income at retirement in exchange for premiums.

Performance Bond A bond required by an organized exchange from both the buyer and the seller of a futures agreement to ensure that both parties abide by the agreement.

Personal Consumption Expenditures Price Index (PCEPI) A price index measures the average change in the prices of all domestic personal consumption expenditures. The PCEPI changes the weights of items in the index as

consumers substitute out of things that have become relatively more expensive and into items that have become relatively cheaper. Thus, it gives a better measure of inflation than the CPI, which does not.

Pit The trading area on the floor of an organized exchange (such as the Chicago Board of Trade) where authorized brokers gather to buy and sell for their customers.

Point-of-Sale Terminal A computer terminal that uses a debit card to electronically transfer funds from a deposit account to the account of a third party.

Points A measure of interest prepayment at the time a mortgage loan is made that lowers the nominal interest rate on the loan; one point is equal to one percent of the loan balance.

Policy Directive A statement issued by the FOMC to the Trading Desk of the New York Fed that directs monetary policy until the next FOMC meeting; in recent years, the policy directive has targeted a specific fed funds rate.

Policy Lag The time between the point when the need for action is recognized and the point when an adjustment policy is decided on and set in motion.

Policy Regret A situation in which policy actions based on available data would not have been taken if more accurate data revisions had been available.

Ponzi Spending Unit A spending unit that must continuously increase its outstanding debt to meet its current obligations or payments.

Positive Spread When the rate of return on assets is greater that the cost of funds on liabilities; this occurs when loan rates are above deposit rates.

Preferred Habitats An expectations theory modification hypothesizing that many borrowers and lenders have preferred maturities, which creates a degree of market segmentation between the short-term and long-term markets.

Preferred Stock Restricted equity claims with characteristics of both bonds and common stock. While dividends must be paid to preferred stockholders before common stockholders, preferred dividends are set at a specific level and do not increase if extraordinary profits are earned. Preferred stockholders generally do not have voting rights.

Premium above Par When a bond sells above its face value because interest rates have decreased since the bond was originally issued.

Prepayment Risk The risk that a mortgage may be prepaid early and the lender will have to reinvest the funds at a lower interest rate.

Present Value The value today of funds to be received or paid on a future date.

Price Risk The threat that an increase in interest rates will reduce the market value of security holdings.

Primary Credit Rate The rate for short-term borrowing of reserves by the healthiest depository institutions from the Fed, also known as the discount rate.

Primary Dealer Credit Facility (PDCF) A program begun in March 2008, whereby primary dealers can borrow overnight from the Fed at the primary credit rate. Designed to increase liquidity and to provide support for the financial system.

Primary Dealers The large banks and government securities dealers that are approved by the Fed to be the main participants in the auctions of Treasury securities that are conducted by the Fed. They also participate in open market operations with the New York Fed.

Primary Market The market in which a security is initially sold for the first time.

Principal The original amount of funds lent.

Private Placement The sale of new securities to a limited number of large investors; because the number of investors is small, the underwriting process is avoided.

Producer Price Index (PPI) A price index that measures changes in cost of goods and services purchased by the typical producer.

Program Trading The preprogramming of computers to buy or sell a large number (basket) of stocks, usually by institutional investors.

Property and Casualty Companies Intermediaries that provide protection against the effects of unexpected occurrences on property.

Property Insurance Contingent claims, exchange for premiums that protect insured policyholders from the financial costs of property loss, damage, or destruction.

Prospectus A subpart of the registration statement that must be given to investors before they purchase the securities.

Purchase and Assumption Method The method of resolving a bank insolvency by finding a buyer for the institution.

Purchasing Power Parity The theory that, in the long run, exchange rates adjust so that the

relative purchasing power of various currencies is equalized.

Put Options Options that give the buyer of the option the right, but not the obligation, to sell a standardized contract of a financial instrument at a strike price determined today.

Q

Quantity Demanded of Money The specific amount of money that spending units wish to hold at a specific interest rate (price).

Quantity Supplied of Money The specific amount of money that will be supplied at a specific interest rate.

R

Rational Expectations Expectations formed by looking both backward and forward.

Real Estate Investment Trusts (REITs) A special type of mutual fund that pools the funds of many small investors and uses them to buy or build income property or to make or purchase mortgage loans; pass-through institutions in which the rents from the income property and/or the interest income from the mortgages are passed through to shareholders.

Real Gross Domestic Product (GDP) The real or inflation-adjusted quantity of final goods and services produced in an economy in a given time period.

Real Interest Rate The interest rate corrected for changes in the purchasing power of money.

Recession The phase of the business cycle in which economic activity decreases and unemployment rises.

Recognition Lag The time it takes policy makers to recognize that a change in the economy's performance has occurred.

Redlining The practice of restricting the number or dollar amounts of loans in an area regardless of the creditworthiness of the borrower.

Registered Bonds Bonds in which the issuer keeps records of ownership and automatically sends the coupon payment to the bondholder.

Registration Statement A statement that must be filed with the SEC before a new securities offering can be issued.

Regulation Q Interest rate ceilings on deposits at commercial banks that were established during the Great Depression and phased out after 1980.

Reinsurance The practice by smaller insurance companies of sharing the risk of a large policy with other insurance companies to reduce risk exposure.

Reinvestment Risk The threat that falling interest rates will reduce future rates of return on current and future cash flows.

Repossession The process whereby a lender takes back the assets used to secure a loan.

Repurchase Agreement Short-term contract in which the seller agrees to sell a government security to a buyer and simultaneously agrees to buy it back on a later date at a higher price.

Required Reserve Ratio The fraction of deposit liabilities that depository institutions must hold as reserve assets.

Required Reserves The amount of reserve assets that the Fed requires depository institutions to hold against outstanding checkable deposit liabilities.

Reserve Bank One of the 12 Federal Reserve Banks; each is located in a large city in its district.

Reserve Need The projected amount of reserves to be supplied or withdrawn by open market operations to reach or keep the fed funds rate prescribed by the policy directive.

Reserves Assets that are held as either vault cash or reserve deposit accounts with the Fed.

Resolution Trust Corporation (RTC) A GSE created in 1989 in response to the savings and loan crisis that issued bonds and used the proceeds to dissolve or find buyers for the failed thrifts and their properties. The RTC went out of business on December 31, 1995, after completing its work.

Restrictive Covenants Stipulations within the bond indenture that limit the ability of the corporation with regard to certain activities.

Restructure (a Loan) Change a loan to allow a borrower who would otherwise likely default to repay (e.g., allow the borrower to pay amounts currently due at some future date instead).

Revaluation Under fixed exchange rates, an increase in the value of a currency by the monetary authorities relative to the official reserve asset.

Revalue Under a fixed exchange rate system, to increase the value of a country's currency.

Revenue Bonds Bonds used to finance specific projects with the proceeds of those projects being used to pay off the bondholders.

Reverse Repurchase Agreement or Matched Sale-Purchase (MSP) Agreement A repurchase agreement viewed from the perspective of the initial buyer. Short-term agreements in which the buyer buys a government security from a seller and

simultaneously agrees to sell it back on a later date at a higher price.

Risk Averse A state of being wherein an economic agent is willing to accept a lower expected return in order to reduce the variability of the return.

Risk-Based Premiums Insurance charges that increase with the perceived risk of the policyholder.

Risk-Based Pricing Charging different interest rates to borrowers based on an assessment of a loan applicant's default risk; highly rated applicants are charged the lowest rates.

Risk Premium The extra return or interest that a lender is compensated with for accepting more risk.

Roth IRA A special type of individual retirement account in which one's contributions are taxed, but the earnings accumulated within the account are tax-exempt.

S

Sales Finance Companies (Captive Finance Companies) Companies that make loans to consumers so they can purchase a product from a particular manufacturer or retailer.

Saving Income not spent on consumption (or paid in tax).

Saving Association Insurance Fund (SAIF) An organization created by FIRREA in 1989 and managed by the FDIC to provide insurance for savings association deposits. In 2005 the SAIF was merged with the Bank Insurance Fund (BIF) to form the Deposit Insurance Fund (DIF).

Savings and Loan Associations (S&Ls) Depository institutions established for the purpose of pooling the savings of local residents to finance the construction and purchase of homes; have offered checkable deposits since 1980.

Savings Associations Savings and Loan Associations and Savings Banks.

Savings Banks Depository institutions set up to help finance the construction and purchase of homes; located mainly on the East Coast.

Savings Deposits Highly liquid deposits that can usually be withdrawn on demand but not by writing a check.

Seasoned Issuance The offering of new securities by a corporation that has outstanding previously issued securities.

Secondary Credit Rate The rate for short-term borrowing of reserves from the Fed by depository institutions experiencing financial difficulties.

Secondary Market The market in which previously issued financial securities are sold.

Secondary Stock Offering An offering of newly issued shares by a firm that already has outstanding publicly held shares.

Securities and Exchange Commission (SEC) The government agency that regulates the securities industry and monitors illegal and fraudulent behavior in securities markets.

Securities Industry Protection Corporation (SIPC) A nonprofit membership corporation established by Congress that provides insurance to protect investors' securities from liquidation by the brokerage firm.

Securitization The pooling and repackaging of similar loans into marketable securities.

Seigniorage The difference between the cost of producing and distributing currency and any revenues earned.

Share Accounts Highly liquid credit union accounts that allow withdrawals on demand, but not by writing a check.

Share Certificates The credit union equivalent of a CD.

Share Draft Accounts Interest-bearing checking accounts of credit unions.

Shelf Registration A procedure that permits a company to register a number of securities with the SEC and sell them over a two-year period rather than at the time of registration.

Short Sell Investors' instructions to brokers or dealers to borrow shares of stocks and sell them today with the guarantee that the investors will replace the borrowed stocks by a date in the future.

SIMPLE Plans (Savings Incentive Match Plan for Employees of Small Employers) Simplified defined-contribution plans created by Congress in 1996 to assist small businesses in offering salary deductions and matching contributions to fund retirement savings for their workers.

Simplified Employee Pensions (SEPs) Small-business pension plans allowed by Congress in 1978 with fewer reporting requirements and costs, and less administrative complexity than traditional pension plans.

Sinking Fund Provisions Provisions of a bond indenture that specify whether the corporation is required to pay off a portion of the newly issued bonds each year.

Smart Cards Plastic cards with a microprocessor chip that are used to make payments; the chip stores

information that allows the payment to be validated.

Social Security The federal government program that provides retirement and survivors' pensions, and disability and health insurance benefits to qualifying individuals.

Solvent When a bank or other firm has assets worth more than liabilities (opposite of "bankrupt" or "insolvent").

Sources and Uses of Funds Statement A statement showing the sources and uses of funds for any sector.

Sources of Funds For any sector, income and borrowing.

Special Drawing Rights (SDRs) International reserve assets created by the IMF to supplement other international reserves.

Special-Purpose Trust A corporate agent that buys financial obligations from a loan originator and works with a security underwriter, credit enhancer, and rating agency to issue asset-backed securities; sometimes responsible for loan-servicing responsibilities.

Speculation The buying or selling of financial securities in the hopes of profiting from future price changes.

Speculative Bubble A increase in asset prices which can not be supported by market fundamentals which may be accompanied by euphoric or irrational expectations.

Speculative Spending Unit A spending unit in which the funds coming in may potentially fall short of the payment outflows if there is an increase in interest rates.

Spot Markets Markets in which the trading of financial securities takes place instantaneously.

Stagflation A condition of concurrent high unemployment and high inflation.

Standard & Poor's, Moody's, and Fitch Investors Service The three major credit-rating agencies that evaluate a borrower's probability of default and assign the borrower to a particular risk class. Visit their sites at **http://www.stockinfo.standardpoor.com, http://www.moodys.com**, and **http://www.fitchratings.com.**

Standby Lines of Credit Lines of credit (commitments) for which a bank is liable but that do not show up on the balance sheet.

State and Local Government Bonds (Municipals) Long-term instruments issued by state and local governments to finance expenditures on schools, roads, and so on.

Stock Savings Bank A type of savings bank charter in which ownership is held by the stockholders.

Stocks Equity claims that represent ownership of the net assets and income of a corporation.

Stop-Out Yield The lowest accepted bid price or yield in a securities auction.

Store of Value Something that retains its value over time.

Stored-Value Cards Plastic cards that have a magnetic strip that is swiped through a card reader to make payments; usually single use.

Strike Price The agreed-upon price in an options contract.

Strike Rate The agreed-upon rate in an interest agreement.

Stronger Version of the Efficient Markets Hypothesis The theory that the prices of all financial instruments not only reflect the optimal forecast of the financial instrument but also the true fundamental value of the instrument.

Student Loan Marketing Association (Sallie Mae) A former GSE, fully privatized in 2004, that issues securities to purchase student loans, thus increasing the funds flowing into student loans and making them more liquid.

Subordinated Debenture Bonds Bonds with no collateral backing that have a general claim after debenture bondholders have been paid.

Subprime Lending The issuing of high-fee, high-interest-rate loans typically made to borrowers with blemished (or nonexistent) credit records.

Subprime Mortgage A mortgage loan made to a borrower with bad credit and little or no down payment.

Superior/Subordinated Debt Structure A framework that allows securities to be sold in at least two different classes or tranches.

Supply of Loanable Funds The supply of borrowed funds originating (1) from household, business, government, and foreign net lenders or (2) from the Fed through its provision of reserves.

Supply of Money The stock of money (M1), which includes currency in the hands of the public plus checkable deposits.

Surplus Sector A sector where the combined surpluses of the lenders are greater than the combined deficits of the net borrowers.

Sweep Accounts A financial innovation that allows depository institutions to shift customers' funds out of checkable accounts that are subject to reserve

requirements and into highly liquid money market deposit accounts (MMDAs) that are not.

Syndicate A group of investment banks, each of which underwrites a proportion of new securities offerings.

T

Temporary Auction Facility (TAF) A program begun in December 2007, whereby the Fed auctions funds to depository institutions for 28 or 84 days. Designed to provide liquidity to the financial system.

Term Life Insurance Life insurance that provides a death benefit to an insured policyholder's beneficiary only if the insured dies within the specified period of time or "term" of the policy.

Term Securities Lending Facility (TSLF) A program where the Fed auctions government securities to primary dealers for a 28-day or longer period in exchange for less liquid and less credit-worthy securities such as mortgage-backed securities. Designed to increase liquidity without increasing reserves.

Term Structure of Interest Rates The relationship between yields and time to maturity.

Term to Maturity The length of time from when a financial security is initially issued until it matures.

Theory of Rational Expectations The theory that expectations will, on average, be equal to the optimal forecast.

Thrift CDs Certificates of deposit issued by savings associations and credit unions.

Thrifts Depository institutions known as S&Ls, savings banks, and credit unions.

Tilt Problem The tilt problem refers to that fact that with inflation, conventional amortized home loans with fixed periodic nominal payments imply declining real payments over time. If homebuyers' earnings increase over time, they will face a larger real burden of home payments early in the loan period, precisely when they are least able to afford them.

Time Deposits Deposits that have a scheduled maturity and a penalty for early withdrawal.

Time Value of Money The terms on which one can trade off present purchasing power for future purchasing power; the interest rate.

"Too Big to Fail" The position adopted by FDIC regulators in 1984 whereby the failure of a large bank would be resolved using the purchase and assumption method rather than the payoff method.

Trade Balance The difference between merchandise exports and imports.

Trade Deficit Situation where merchandise imports are greater than exports.

Trade Surplus Situation where merchandise exports are greater than imports.

Tranche A particular class or part of a securitization issue; some parts may be backed only by principal payments, others only by interest payments.

Transactions Costs The costs associated with borrowing and lending or engaging in other exchanges.

Transactions Deposits Deposits that can be exchanged for currency and are used to make payments through writing a check or making an electronic transfer.

Treasury Inflation-Protected Securities (TIPS) Bonds whose principal amount is adjusted for inflation or deflation at the time when coupon payments are made (usually every six months).

Treasury Notes Securities issued by the U.S. government with an original maturity of one to 10 years.

Treasury STRIPS A type of government security that allows investors to register and trade ownership of the interest (coupon) payments and the principal separately.

Troubled Assets Relief Program (TARP) The program under the EESA that initially authorized the U.S. Treasury to purchase up to $700 billion of "toxic" mortgage-backed securities from financial institutions. The TARP program was revised 10 days after the EESA was signed. Under the revised TARP program, the Treasury would use the bailout funds to purchase newly-issued preferred stock in troubled institutions.

U

U.S. Central Credit Union The central bank for credit unions.

U.S. Government Agency Securities Long-term bonds issued by various government agencies, including those that support real estate lending and student loans.

U.S. Government Securities Long-term debt instruments of the U.S. government with original maturities of two to 30 years.

U.S. Treasury Bills (T-bills) Short-term debt instruments of the U.S. government with typical maturities of three to 12 months.

Uniform-Price Method An auction method whereby the seller

of securities accepts bids prior to selling securities. Sales are awarded beginning with the highest bidder and continuing toward the lowest until the desired number of securities has been sold. All buyers pay the same price for the securities based on the stop-out yield. The Treasury instituted this auction-pricing method in 1998.

Uniform Reserve Requirements Reserve requirements that apply to particular types of deposits and are the same across all depository institutions.

Unit of Account A standardized accounting unit such as the dollar that provides a consistent measure of value.

Universal Life Insurance A form of permanent life insurance that provides a pure insurance product as well as a separate account. This separate account grows at a fluctuating rate of interest similar to that received on a money market account or short-term CD. Premium payment amounts may be flexible as long as the minimum premium for the pure insurance benefit is met.

Universal Reserve Requirements Reserve requirements to which all depository institutions are subject.

Uses of Funds For any sector, current spending and changes in financial instruments held.

Usury Ceilings Maximum interest rates that FIs may charge on certain loans.

V

Variable Life Insurance A form of permanent life insurance that provides a pure insurance product as well as a separate account. The separate account may be used by the policyholder to purchase mutual funds from a list of insurance company-approved funds. These equity-linked funds pay a minimum death benefit as long as sufficient premium payments are received.

Veterans Administration (VA) A federal agency that, among other things, insures mortgage loans made by privately owned financial institutions up to a certain amount if the borrowers meet certain conditions, including being military veterans.

W

Warrant Contracts sometimes issued with newly issued bonds; warrants give the holder the right to purchase a designated security at a price set today; warrants may be sold to a third party.

Whole Life Insurance A permanent type of life insurance that charges a fixed premium and pays a fixed death benefit, and whose separate account is invested by the insurance company for the policyholder's benefit.

World Bank An investment bank created in 1944 that issues bonds to make long-term loans at low interest rates to poor countries for economic development projects.

Write-Off Officially recognize a loan to a borrower who is not repaying, and not likely to repay in the future, as worthless.

Y

Yield Curve A graphical representation of the relationship between interest rates (yields) on particular securities and their terms to maturity.

Yield to Maturity The return on a bond held to maturity, which includes both the interest return and any capital gain or loss.

Z

Zero-Coupon Bonds Corporate bonds sold at a discount, with the difference between the amount paid for the bond and the amount received at maturity equal to the interest.

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Maureen Burton received a B.A. from the University of Missouri at Columbia in 1971, an M.A. from California State University Fullerton in 1979, and a Ph.D. from the University of California at Riverside in 1986. All were in economics. She taught at Chaffey College from 1984 to 1987 and at Cal Poly Pomona since 1987 where she is a full professor. At Cal Poly Pomona, she has served as Coordinator of the Graduate Program and a Chair of the Economics Department. She is currently the Chair of the Faculty Rights Committee for the Cal Poly Chapter of the California Faculty Association. In addition to other publications, she co-authored an introductory text *Economics* (Harper Collins, 1987) with S. Craig Justice and *An Introduction to Financial Markets and Institutions*, (South-Western College Publishing, 2002) with Reynold Nesiba and Ray Lombra, with a second edition to be published in 2010 by M.E. Sharpe. Her main areas of interest include monetary policy and financial crisis.

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